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SELECTED PAPERS PRESENTED AT THE EIGHTH WORLD CONGRESS OF THE INTERNATIONAL SOCIETY FOR REHABILITATION OF THE DISABLED

INTRODUCTION

Special Editor

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ON THE last Saturday in August, 1960, the vanguard of some 3,000 delegates from 70 nations arrived in New York for the Eighth World Congress of the International Society for the Welfare of Cripples.

Today there is no longer an "International Society for the Welfare of Cripples." By an overwhelming vote, the members changed the name of the 37-year-old confederation of national voluntary agencies to the "International Society for the Rehabilitation of the Disabled."

Better than any other event of the 6-day meeting, this name change illustrates the new philosophy developing throughout the world in regard to physically handicapped persons. The paternalistic approach of protection and welfare is being replaced by the dynamic concept of opportunity through rehabilitation. The "basketry, beadwork, and boredom" that characterized the life of the physically handicapped a few decades ago is gone.

This special Symposium Issue of the JOURNAL OF CHRONIC DISEASES consists of a number of papers printed at the Eighth World Congress. The scope of material included in this issue is wide. It ranges from philosophical presentations, as the paper by Miss Mary E. Switzer, Director, Office of Vocationl Rehabilitation, Department of Health, Education, and Welfare, on "The Contribution of the Handicapped to the World Economy" to such highly technical papers as as that of Wilbert Pronovost, Ph. D., on "The Speech Behavior and the Language Comprehension of Autistic Children." The Editors of the JOURNAL OF CHRONIC

DISEASES have deliberately chosen a broad sampling of the papers presented at the Eighth World Congress for a number of reasons:

1. A broad selection illustrates the wide variety of problems with which the International Society for Rehabilitation of the Disabled is concerned.

2. It shows that these are problems with which physicians and others throughout the world are deeply concerned.

3. It shows the varied persons who are concerned with these problems—neurologists, pediatricians, speech pathologists, administrators, volunteers, and many others.

The International Society has much in common with the JOURNAL OF CHRONIC DISEASES and its readers. Both are concerned with the problems of chronic disease and physical diability among all people, regardless of age, nationality, geographic residence, or the underlying reasons for their illnesses and disabilities.

The 450-page printed *Proceedings* of the Congress will be available from the International Society for Rehabilitation of the Disabled, 701 First Avenue, New York 17, New York. The papers printed in the Symposium, however, will not be printed in the *Proceedings* and are being published only in this JOURNAL.

Over the centuries mankind, of necessity, has been forced by the technologic changes in his environment to adapt to new concepts and social patterns. It is particularly encouraging, however, when progress comes from voluntary action rather than from necessity. In the future we will read and hear the word "cripple" less and less. Perhaps some day it will be obsolete both as a word and as a concept. When that day comes, the work of the International Society for the Rehabilitation of the Disabled will be completed.

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REHABILITATION AND WORLD PEACE

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THIS IS an exciting moment—the first working session of the Eighth World Congress of the International Society for the Welfare of Cripples. Our theme is "Rehabilitation for Peace." Today the paramount world problem is how to have real peace, peace based on fundamental international understanding.

Once you have justice, peace will come. Peace is like friendship; it cannot be sought or bought; it must be earned. If we could first have world justice, then most certainly we would have world peace.

I believe this is the feeling of all people and especially of disabled people, the people who represent the greatest minority group in the world today. Justice, to them, means the right to compete with their so-called normal brothers; the opportunity to be treated and trained to live the best lives they can with the abilities they have. They ask to be judged on their abilities, not on their disabilities. They do not ask for opportunity as a gift, nor do they ask favoritism over their normal brothers. They seek only the chance to start even, to earn their right to dignity. Only such justice can bring them peace—peace of mind. To have understanding we must first have justice, justice based on freedom and opportunity.

The development of rehabilitation over the past 15 years seems to me to parallel the development of atomic energy. In the bleak days of World War II, military and veteran services throughout the world developed rehabilitation services almost on an emergency basis, designed to get as many sick and wounded fighters as possible back into the lines. This paralleled the early days of atomic development, when scientists everywhere worked round the clock to develop an atomic bomb for war.

After the armistice the United States and other nations, the United Nations and its specialized agencies, and many voluntary groups retooled their rehabilitation programs to meet the needs of the war wounded, the war forgotten in the refugee camps, and the sick and disabled civilians at home. Personnel and money were given to help in these situations. Much was accomplished. New techniques were developed, not only medical, but social and industrial. We started to learn

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that, properly trained and placed, the disabled made good workers not only production-wise, but in dedication to their jobs. These programs provided new tools for both action and understanding during this trying period when the underprivileged and war-torn nations were on their knees desperately trying to rebuild. These programs were carried on in spite of the vast sums devoted to the maintenance of armed forces throughout the world to fight again, if necessary, for survival. This phase of rehabilitation paralleled the period of atomic bomb stockpiling—bombs for survival.

Now we are in the third phase. The atom has been harnessed for peaceful use, and we hope for a new era of world prosperity with this harnessed power used as a servant of man.

Today we talk of rehabilitation for peace. Here is a great human tool more powerful even than the harnessed atom, because it brings not only new skills to production, but new hope into the hearts of men.

Much has been done, especially in the past decade, to develop rehabilitation programs for the paralyzed, the amputee, the cardiovascular and pulmonary cripple. But many of the needs of the disabled throughout the world are still unmet. For example, it is estimated there are twice as many working hands in the world disabled from Hansen's disease alone than by all of the other diseases and disabilities known to medicine, including poliomyelitis, arthritis, injuries. In spite of the great advances made in therapy, tuberculosis still stalks in many areas of the world as a master killer.

During the past decade, social concepts have developed into economic victories. In Burma, for example, disabled soldiers are kept in the military service. In the past they sat by in idleness and dejection. Today they form a service force in the Burmese military system. They live with their families in their own homes in specially designated areas where they make and repair shoes and clothing for the Army, manufacture furniture, bamboo mats, and scores of other articles. They are the supporting force to the fighting force.

In Peru an institute for brain research has been established in the great new military hospital in Lima. A wing has been given by the armed forces to create this research institute that will attract brilliant young Peruvian scientists trained abroad to return to their homeland commissioned in the service, but allowed to go the research route rather than the fighting route. Both military and medical leaders in Peru feel this is a new and fundamental concept of the military—to be interested first in preparing to fight and fighting, but to be dedicated to the total welfare of the people of their country and of the world. If all fighting forces throughout the world could so dedicate a portion of their time and energy, the philosophies of armies might well change.

During my visit to the Soviet Union several years ago, a toast was proposed at the opening dinner by one of the officials in the Ministry of Health: "In the fields of medicine and music the world has a common language. We would like to show you what we are doing in our country and learn from your experience, for by so doing we will improve the health and welfare not only of our own people, but of the world. If we work together in this field, we will learn to know each other better, which should help us one day to live together in peace."

I believe that dedicated workers in rehabilitation throughout the world feel just this way. But this cannot be a tool for political pressure. Knowledge must be exchanged freely because we believe in justice for those whom we serve, the great armies of the disabled throughout the world. Justice for them means new opportunities for friendship and understanding for those of us dedicated to this cause. But this is earned only through service.

Here at this meeting are representatives from over 60 countries. Many are here at great personal sacrifice. All are dedicated to one goal: We are here for one primary reason—to learn, to take back new knowledge, new techniques, and a renewed spirit. We working in the field of rehabilitation are truly blessed that in this world so technologically advanced yet spiritually retarded, we speak a common language.

We have simultaneous translations in 4 languages for the Congress. They are necessary for us to understand details in other tongues, but no translation is necessary for us to understand each other; unspoken understanding is in the hearts of all of us. This is our common language.

We have a unique opportunity not only to serve the disabled but to promote world understanding. It is a magnificient opportunity but an almost overwhelming responsibility. Here at this Eighth World Congress of the International Society for the Welfare of Cripples, let us rededicate ourselves to this task: rehabilitation for peace.

SIGNIFICANT TRENDS IN THE CONTROL OF POLIOMYELITIS AND ITS SEQUELAE

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IT IS NOT possible in the time at my disposal to give an exhaustive analysis of the status of all the latest developments in the field of poliomyelitis. The rapid advance in the control of poliomyelitis is one of the most inspiring examples in modern medical history of the value of dynamic coordinated action against a disease, and the integrated scientific effort displayed against this world-wide "flagellum" has opened up many new avenues in research that run all the way from cell biology to lung physiology.

For this discussion I have chosen some salient points in each of the basic aspects of the prophylaxis, diagnosis, and treatment of this disease.

I. TRENDS IN THE PROPHYLAXIS OF POLIOMYELITIS

A study of the scientific program of five International Poliomyelitis Congresses gives a quick summary of the history of the advance against this disease in the last decade. The displacement of emphasis from an initial preoccupation with the problems of treatment to an analysis of the advances in preventive methods reaches its peak in this year's Conferences in which only viral and related themes are discussed.

This does not mean that the paralytic sequelae are things of the past, for unhappily poliomyelitis with its crippling results seems to be appearing in countries that were once thought to be free from its central nervous system manifestations. But the faith of those who believed that the logical approach to the problem was essentially prophylactic has been partially fulfilled and the possibility of the final eradication of the virulent types of poliovirus seems to be within our grasp.

The extensive application of killed virus vaccine has confirmed the value of this system of immunization for protection against paralysis, but at the same time it has stressed the importance of the fact that it does not produce intestinal

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resistance and so cannot break the chain of the community transmission of virulent natural strains of poliovirus.

The search for a means of stopping an epidemic of a paralytogenic type of poliovirus has led to the present emphasis upon methods of immunization that can parallel the natural infection.

The live virus vaccine apparently mimics the system of natural exposure and not only produces circulating antibody levels which are considered protective against invasion of the central nervous system, but also provokes a relative alimentary tract resistance against all three types of poliovirus in practically 100 per cent of vaccinated persons.[1-10]

The problem of increased neurovirulence after multiple human passages is still one of the basic factors in limiting the free administration of the vaccine. According to the requirements for acceptance established by the Public Health Service, a live polio vaccine can be considered satisfactory only if the neurogenic capacity is low and if the strains employed demonstrate an "inability to revert to significant neurovirulence after passage in human beings."[11]

The initial field experiments with attenuated strains had been authorized by the WHO Experts Committee on Poliomyelitis in 1957, with the understanding that the strains used should show a "complete lack of paralytogenic activity in IC [intracerebral] inoculation of maximal doses (in excess of 10^7 TCD_{50} [tissue culture doses]) in rhesus or cynomolgous monkeys, and only minimal residual neurotropism by spinal (IS) inoculation in monkeys, i.e., only rare developments of localized nonprogressive paralysis in monkeys receiving doses of 10^6 TCD_{50} or more."[12]

Published and progress reports[11] since then have demonstrated evident reversion in some of the strains disseminated by vaccinated individuals, and a standard study of three sets of oral vaccine presently employed in extensive field trials showed that none were completely nonvirulent when inoculated into monkeys by the intraspinal route.[13]

The degree of this increased neurogenic activity has been emphasized in some recent studies,[10,11] but the point under discussion is the true importance of this reversion from the aspect of safety. Several countries have already decided to go ahead with mass inoculation since the increased neurotropic activity of the vaccinal strains "rising to a concentration of 3.5 to 4.5 log 10 are of no practical significance, since even at the level of pathogenicity for monkeys the vaccinal strains remain completely harmless for human beings."[14]

In vitro markers have been developed to check on the stability of the strains employed in the vaccine, and are used also for the control of activity after multiple human passage.[14,15,38]

Early studies[16] had shown that attenuated and virulent strains reveal different characteristics in their environmental tissue cultural requirement. The d (delayed mutant) strains grow poorly and form relatively few plaques at low bicarbonate concentrations, while d+ virulent strains are not affected and grow equally well with either high or low concentration.[17]

The T marker segregates the virulent strains that can develop plaques at 40° C. from the more attenuated types that require lower temperature for plaque

development.[37] The attenuated strains also show a restricted growth on MS (monkey stable) cells.

The use of markers allows for the initial separation of strains with greater neuropathogenic characteristics, and presents less expensive methods for the control of the mutations of the virus shed by vaccinated individuals. MS +, d +, and T + markers characterize the natural virulent polio strains found in a community during an epidemic. Increased investigation is still required, however, in order to determine the exact relationship of in vitro reversions to changes in monkey neurovirulence.[18]

The in vitro markers are also employed for the control of the genetic stability of the different vaccine lots and one of the conditions established by the Public Health Service Committee is that lots that show different markers from those of seed virus should not be used in humans.

The safety of the live virus vaccine seems to be amply confirmed by the results of the mass administration programs,[15,19] and the control studies carried out during the past year. In 15 million children inoculated during 1958, of whom 700,000 were triple negative, secondary reactions in the vaccinated persons and contacts have been negligible, and virus-induced paralysis has not been reported from the various areas where the vaccine has been administered.[14,18,38]

The potency requirement for the strains to be used in licensed vaccine has been established at a 90 per cent conversion level to be obtained with two doses in susceptible persons.[18] Numerous studies are currently being conducted in order to determine the antigenic capacity of the different strains in use under controlled and mass administration.

Results so far have given very variable results, although in general it has been shown that the orally administered attenuated polioviruses are clearly effective antigens for children. The results with adults have varied according to different field trials. Many factors have to be taken into account in the analysis of effectivity of the vaccine, and carefully designed and closely evaluated studies are in the process of being carried out in order to resolve the multiple "incognita."[38]

The problem of interference (i.e., suppression of infection and of antibody induction) by other enteroviruses prevalent in the community is one that must be taken into account in an oral vaccine, and is being studied intensively by different groups. It has been suggested that the most practical solution would be the routine administration of live virus vaccine to the newborn before the invasion of the intestinal tract by other viruses.[20] This same phenomenon of interference is the controlling factor in the order of the sequential administration of the different vaccine strains, since simultaneous feeding of three strains occasionally results in partial or complete suppression of one of the types.[8]

In regard to the effect of maternal antibodies upon the ability of the young infant to produce active antibodies, there have been marked discrepancies of opinion.[20-23,33] Some researchers suggest late vaccinal schedules (starting at 6 to 8 months of age) when passive placental antibodies are at the lowest level, while others maintain the validity of early administration since, even though the immunologic competence of the young child is not high, the anamnestic response of a booster at 6 months of age leads to a high antibody level. The determination

of the best age for application is of more than academic interest to populations such as those of Israel or Argentina, where the incidence of paralytic polio in the second semester of life is high, just at the period when the passive placental antibody titer is at its lowest level.

The duration of the immunity produced by the ingestion of attenuated virus vaccine has still not been established. It has been maintained that since the primary infection produced by the live virus parallels the process of natural infection by wild strains, the immunity obtained should be prolonged.

Under controlled conditions the vaccine seems to be a fairly good antigen and produces a seroimmunity and an intestinal resistance to poliovirus which last for years,[24] although there is a certain discrepancy between the claims of different workers.[25,26] The net duration under mass application programs can be determined only by the serologic sampling of the vaccinated population.[18] Most mass programs call for a revaccination at varying periods after the primary series (3 months to 1½ years).[18]

Contagiousness of the live-virus vaccine and extensive spread to susceptible contacts of the vaccine strains have been demonstrated by numerous studies.[27,28,38]

The degree of dissemination in the community depends, however, upon multiple factors: age of the vaccinated subjects, socioeconomic status, concurrent enteric virus epidemics, immunogenic character of the strains, etc. It has been found that some attenuated strains spread much less freely than the virulent natural or wild strains, and contacts show only abortive infections and no increase in circulating antibodies.[18]

Methods and Materials.—Three basic sets of attenuated strains are currently under intensive field trials (Sabin, Cox, and Koprowski). Sequential monovalent administration is under observation in order to determine the best sequence, the intervals, and the doses which produce the highest immunologic response in 90 per cent of the vaccinated population.[30-32,38]

Trivalent live-virus vaccine is also being administered under controlled and mass conditions. The advantages are evident and primary conversion rates seem to be satisfactory as judged by antibody response.[29,38]

It is important to observe that the use of live-virus vaccine in the prophylaxis of poliomyelitis initiates a method of mass immunization that creates problems which are new in preventive medicine.[28]

The rapid dissemination to susceptible contacts of the vaccinated persons creates an ethical problem—the right to protect an individual by exposing others.

The practical problem hinges upon the true significance of the neurovirulent reversion of inoculated strains. The administration of live-virus vaccine precipitates what has been aptly called an "immunizing epidemic,"[27] especially in a population where contact is intimate and sufficient.

While all these considerations are holding back the free administration of live-virus vaccine in some countries, others feel that the advantages so outweigh what they consider theoretical limitations that nationwide application has been utilized.[18,38]

It is hoped by this system of mass application to eradicate the virulent wild strains from the community. The intestinal resistance produced by the feeding of

attenuated strains should break the circulation of the neurogenic types, and so diminish the possibility of the explosive dissemination of virulent natural polioviruses.[34] This approach to epidemiologic control of epidemics of paralytic poliomyelitis is being used in the USSR where, under Chumakov,[19,38] vaccine is being administered to all individuals between 2 months and 20 years of age, a total of 77 million people. Fifteen million children were vaccinated during 1959.[38]

Czechoslovakia and Hungary also have under way a similar program with the Sabin strains, while the Cox strains are being applied in Florida and Minnesota on a community-wide basis. There are several interesting observations of prolonged low attack rate of poliomyelitis in populations that have been submitted to an intensive oral vaccine program.[1,5] The true effectiveness of this system will be revealed, however, only after several years of close surveillance of epidemiologic results. Nevertheless, the evidence is sufficiently significant to warrant the large-scale experiments now under trial.

II. PROBLEM OF DIAGNOSIS IN ACUTE POLIOMYELITIS

The rapid advances in virology in the last decade have complicated life considerably for the physician whose clinical diagnosis of paralytic or nonparalytic poliomyelitis was generally sufficient to satisfy both the patient and the Communicable Diseases Departments of the Public Health Service. Now, with a whole new series of viruses taken out of "orphanages" and attached to their respective syndromes, he finds that the poliovirus has been displaced from its place of pre-eminence, and has lost its pride of position as main causative agent of nonparalytic central nervous system infections, and that even in the paralytic form he cannot be absolutely sure that another enterovirus is not implicated in the etiology.

Intensified research on the ecology of the enteric viral group has shown that not only the poliovirus, but also the Coxsackie and ECHO viruses possess the protean capabilities which enable them to give rise, as Lennette[42] mentions, to a broad spectrum of syndromes of the central nervous system embracing the clinical picture of aseptic meningitis, mild-to-moderate paralytic poliomyelitis, meningoencephalitis, and encephalomyelitis.

Epidemics of acute infection of the central nervous system, indistinguishable clinically from nonparalytic poliomyelitis, have been appearing upon the epidemiologic scene during the last 5 years.

In 1955 Italy and Britain reported outbreaks of aseptic meningitis due to ECHO, while in 1956-1957 the number of cases observed in Canada, the United States, and Europe, due to the same group, constituted almost a pandemic.[44,46]

Epidemics due to Coxsackie viruses have also been reported, the B_5 having been implicated most frequently; but cases have been presented of aseptic meningitis in association with many strains ($B_{1\text{-}5}$, and $A_{2,4,9}$).[46]

An interesting fact is that the different enteric groups seem to replace each other in the community, and successive waves of infection due to different antigenic types have been observed by the viral control laboratories. In 1957, in

Minnesota, the aseptic meningitis syndrome was caused by the ECHO9 strain, while in 1958 the predominating virus was the B_5.[46,62,64]

The importance of these agents in the etiology of aseptic meningitis, in meningoencephalitis, and in nonparalytic poliomyelitis is also emphasized by the percentage of cases corresponding to the Coxsackie or ECHO group when a serologic and virologic investigation is carried out. Among many others, Meyer and co-workers[50] found that, out of 430 cases (1959) diagnosed as aseptic meningitis, 18 per cent were due to Coxsackie B, 12 per cent to the ECHO group, 16 per cent to the mumps virus, and only 9 per cent to poliovirus. Kloobyavian[41] in a 2 year period found that 40 per cent of the cases of aseptic meningitis were associated with an infection by a Coxsackie or ECHO virus.

In the Detroit epidemic, according to Brown and associates,[61] more cases of nonparalytic polio and aseptic meningitis were due to either Coxsackie or ECHO than to the poliovirus itself.

The accumulation of evidence of the importance of these other enteroviruses in the diagnosis of nonparalytic poliomyelitis underlines the range of error in morbidity statistics when nonparalytic cases, which comprise 30 to 50 per cent of reported cases, are included in poliomyelitis incidence figures.[42]

Although the paralytic syndromes seem to be basically associated with poliovirus infection, nevertheless, reports are accumulating on paralytic disease produced by the nonpoliomyelitis enteric viruses.[46] The Coxsackie B group apparently produces central nervous system lesions similar to those of poliovirus in location and histologic appearance, while the ECHO viruses seem to include more encephalitic manifestations (drowsiness, disorientation, and convulsions), but both groups have been etiologically associated with slight-to-moderate prolonged paresis.

These findings have an important bearing upon the estimation of the true incidence of paralytic polio in vaccinated individuals, and show the indispensable requirement of obtaining viral and serologic confirmation of the clinical diagnosis of poliomyelitis.

It must be remembered, nevertheless, that since most of these strains have been found in the alimentary tracts of healthy individuals, the evidence for a causal relation between a specific strain and the central nervous system manifestations observed in the patient must be carefully validated by isolation of the type if possible, in a site remote from the oro-intestinal system, and by correlation between the same strain and a rising antibody titer in paired sera. Habel[63] points out also that mere isolation of a particular virus and the demonstration of a rise in specific antibodies during development of an illness does not establish that this particular clinical condition was caused by that virus, although it is probably sufficient to conclude that the patient was infected by that agent. The fact that these infections have been demonstrated with increasing frequency, however, and that like the poliovirus they can invade the central nervous system through a hematogenous spread (from the primary site of multiplication in the alimentary tract) makes it imperative to revise the criteria for diagnosis and reporting of poliomyelitis, both nonparalytic and paralytic.

III. PROBLEMS IN THE COMPREHENSIVE CARE OF THE VERY SEVERELY DISABLED POLIOMYELITIS PATIENT

Before closing I would like to touch upon some of the unresolved problems that still face us in the total care of the poliomyelitis patient who has severe respiratory insufficiency.

The recent advances in breathing devices and techniques of treatment have led to a markedly increased life expectancy, and this, in its turn, has brought to the fore a whole series of new situations in the clinical, physiologic, and rehabilitation fields.

The need to maintain a normal pulmonary gas exchange in individuals who are permanently dependent upon an artificial respiratory aid has stimulated basic research in the mechanics of breathing, and has led to a better understanding of the pathologic physiology of respiratory poliomyelitis. Applied research in the respiratory field is currently oriented toward the finding of more efficient respirators with a closer correlation between the pressure variations obtained during artificial ventilation and the normal pulmonary pressure curves, and the establishing of better clinical methods for the diagnosis and treatment of the multiple respiratory problems that appear during the care of the patient with life-threatening sequelae.

In orthopedics, new methods in the treatment of scoliosis are being actively explored. Varying approaches have been sought toward solving the problem of progressive deformity in the growing child, and prophylactic methods, such as internal metallic fixation, seem to be promising.[57] However, only a prolonged and meticulous follow-up will show the true value of these or other methods under trial and allow definitive conclusions to be drawn.

Intensive experimentation is presently being carried out in the field of upper extremity disability. One of the interesting developments is the utilization of an external artificial muscle governed by electronic or mechanical devices to replace the lost function. The application of these techniques requires a multidimensional team approach and a long period of training; but the possibility of obtaining effective movement in paralyzed limbs opens up new horizons for the severely affected patient.

While the goal of full employment is evidently unattainable in the majority of the respiratory cases, nevertheless, a high percentage can be returned to meaningful family life, if adequate home care programs are carried out. Each country that has recently faced a serious epidemic is in the process of establishing the best method to fulfill this aim within the particular mores and facilities of the community.

In conclusion, I would like to emphasize the need for the physician to take the responsibility for more active leadership in new advances in the field of comprehensive rehabilitation. The readaptation of a disabled individual to a spiritually, socially, and economically satisfactory existence requires the coordinated efforts of a large group of specialists; but it is to the doctor himself that the physically handicapped individual first brings his problems and looks for a solution. In the final analysis, what is rehabilitation but the practice of good medicine?

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CURRENT ETIOLOGICAL CONCEPTS OF CEREBRAL PALSY OF POSTNATAL ORIGIN

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TO DETERMINE the relative importance of postnatal causes in the production of cerebral palsy, a brief survey was carried out at the Junior League Cerebral Palsy Clinic in Toronto on the records of 377 children consecutively appraised at the clinic. While it is frequently impossible to decide the etiology of many cases of cerebral palsy, it is usually not difficult to decide on those which have a postnatal origin.

Of the 377 cases of cerebral palsy, 38 appeared to be of postnatal origin, approximately 10 per cent.

The causes in this group appear to be as follows:

Postnatal jaundice	23 cases
Head injury	9 cases
Meningitis and encephalitis	3 cases
Convulsions	3 cases

POSTCONVULSIVE PARESIS

The Clinical Syndrome.—A previously healthy child, usually between the ages of 18 to 48 months, suddenly convulses without obvious cause. These may be generalized or focal, are usually associated with a temperature of 104° to 106° F., are difficult to control, and may last for a considerable period of time, often several hours.

The examination of the cerebrospinal fluid is negative and the electroencephalogram reveals either a diffuse, slow wave disturbance or, if the convulsions are focal, a localized slow wave disturbance.

Recovery is slow, the child remains drowsy or comatose for some time, and it soon becomes obvious that there is a motor deficit, usually a hemiplegia or a quadriplegia.

If the weakness is mild it may be expected to clear without obvious sequelae, but if the weakness is marked there is usually a permanent deficit, paresis, spasticity, mental retardation, and occasionally recurrent convulsion.

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This syndrome has been known for many years under different titles: "acute infantile hemiplegia of unknown origin," "Marie-Strümpell encephalitis," "polio encephalitis," "brain damage following febrile convulsions." We have been interested in this particular syndrome and a special study of this problem was carried out at the Hospital for Sick Children in 1954 and 1955 by Dr. Douglas McGreal.

Frequency.—It appears to be less frequent at the present time than it was some years ago at which time we might see from 5 to 10 children a year with post-convulsion paresis. Ford[1] reported approximately 50 cases seen at Johns Hopkins over a period of years.

Pathologic Manifestations.—Relatively few children die in the acute stage. In our experience the usual findings are a diffuse cerebral edema with swelling and necrosis of the neurons, and toxic changes in other organs, most frequently fatty degeneration of the liver. A recent study[2] reports neuronal necrosis of variable distribution and severity in the cerebral cortex, basal ganglia, and cerebellum. The findings are almost indistinguishable from those associated with cerebral anoxia.

Etiology.—A number of theories have been advanced for the etiology of the condition, but the most frequent have been the encephalitic and vasculothrombotic theories. It is difficult to accept the encephalitic theory in view of the essentially negative cerebrospinal fluid and the absence of any findings of encephalitis at postmortem. It is also difficult to accept the vascular origin in view of the essentially normal health of the children prior to the illness and of the fact that thrombosis has rarely been found at postmortem in these cases.[3] At the present time it appears that no definite cause has been found for the convulsions although, in view of the elevated temperature, it is probable that they are associated with an infectious process.

It is our opinion that the paresis is not the result of an encephalitic process or a vascular occlusion but represents an exhaustive phenomenon associated with the convulsions themselves. The basis for this concept is the following:

1. Postconvulsive weakness has been observed in epileptic patients since 1855 (Todd's paralysis).[1]

2. Observations of the cerebral cortex during convulsions have shown significant changes in the cortical vasculature during the attack.[4,5] There is usually a local or generalized increase in blood flow, a dilatation of the pial arterioles, and a distention of the venules with dark cyanotic blood.

3. Postmortem examinations upon persons with chronic epilepsy have shown areas of petechial hemorrhages, degeneration of the neurones, and replacement of the cells by gliosis.[6] Postmortem studies on those who died in status epilepticus reveal acute changes in the cortex, the ganglia shrunken and disintegrated, and the Nissl bodies fragmented.[6]

4. Focal convulsions in animals were produced through electrical stimulation by Meyer.[7] A significant increase in the diameter of the pial vessels was noted during the convulsions. Some of the arteries supplying the cerebral cortex were ligated and it was noted that postconvulsive paresis was found in areas

with deficient or marginal blood supply but was not found in areas with adequate blood supply to the cortex.

5. A recent study[8] of the cerebral circulation of children with the use of a modified nitrous oxide technique showed that the cerebral blood flow of a 6-year-old child was 60 per cent higher than that of the adult and that the cerebral tissues consumed approximately 50 per cent of the total oxygen consumption of the child. It is possible that an even greater proportion of the total oxygen intake of the individual would be consumed by the brain of the 2-year-old child where there is a greater disparity between the size of the brain and the body and where the brain is comparable to the adult brain in size and microscopic structure.

In adults the oxygen consumption of the gray matter is thirty times that of resting muscles with the highest values for the motor cortex and the cerebellum.[9]

6. We believe the following factors play a significant part in the postconvulsive paresis of children:

A. The convulsive activity in the cortex is associated with an increased metabolic demand of the cortical cells.

B. Since an increase in temperature of 1° F. means an increase in basal metabolism of 7 per cent, the associated elevation of temperature to 104° or 106° F. means an increase in cerebral metabolism of approximately 50 per cent.

C. The associated cerebral edema will interfere with the transportation of nutrients from the capillaries to the cerebral neurones. A recent article[10] suggests that cerebral edema is not due to an accumulation of fluid in extracellular spaces, but to the accumulation of fluid in intracellular spaces, primarily the oligodendroglial tissues. The electron microscope shows that the oligodendroglial cells lie between the capillaries and the neuronal bodies, and that the normal transmission of nutrients from capillaries to the cell bodies is through these glial cells. The changes in the oligodendroglia with the increased edema means a greater distance, and presumably a greater resistance to the transfer of metabolites.

D. The syndrome could be intensified by an inadequate oxygen intake associated with the convulsions or obstruction of the airways, and by hypoglycemia secondary to the increased metabolic demands of the body.

It is felt that these factors combine to produce a relative starvation of the cells comparable to that found in anoxia. It occurs at an age when the cerebral tissues are relatively mature and the oxygen demand of the cerebral tissues compared to the rest of the body is at a very high level. One cannot state whether the syndrome is due to any specific metabolic defect or to a combination of several defects.

Treatment.—

1. Since the degree of paresis is related to the duration of the convulsions, it is essential to terminate the convulsions as soon as possible. Recurrent convulsions should be dealt with as a relative emergency.

2. It is necessary to provide an adequate oxygen intake. This might include clearance of the airways, intubation, and the administration of oxygen.

3. In order to reduce the cerebral edema, 50 per cent glucose or urea in invert sugar should be administered. While urea appears to be most effective in

reducing the cerebral edema, the administration of hypertonic glucose may have an additional therapeutic effect.

4. Since the elevated temperature increases the metabolic demand, it should be reduced by sponging, alcohol baths, or if necessary through modern techniques of hypothermia.

KERNICTERUS

Kernicterus may be defined as a syndrome caused by damage of specific nuclei in the brain by neonatal jaundice.

The clinical syndrome may be briefly summarized as follows. In the early weeks the infant usually shows opisthotonus and generalized extensor rigidity. As the child grows older there occurs the gradual development of extrapyramidal signs, usually choreo-athetosis and dystonia. In addition there may be signs of pyramidal tract and cerebellar dysfunction, disturbances of hearing, either deafness or perceptual asphasia, and intellectual retardation.

Present Concepts of Etiology.—

1. It has been recognized for years that this syndrome is due to the deposition of a yellow pigment in specific areas of the brain. The areas involved, in order of frequency, are: (a) the basal ganglia, subthalamus, and medullary nuclei; (b) the cochlear nuclei, hippocampus, inferior olive, and dentate nucleus; and (c) occasionally the cerebral cortex.

It is interesting to note that the nuclei most frequently involved are those which are actively functioning in the newborn and are the same nuclei that are most susceptible to damage by anoxia at that time.

2. It has been known for some time that the pigment in the nuclei is bilirubin. Hemoglobin, an iron compound, breaks down into globin, iron, and an iron-free pigment, bilirubin.

3. The formation of excessive amounts of bilirubin occurs in a number of conditions associated with the destruction of blood. The most common in the neonatal state are Rh incompatibility, ABO incompatibility, congenital hemolytic anemia, and anemia due to infections.

We might briefly review the mechanism underlying the production of anemia in situations where the mother is Rh negative and the fetus Rh positive. During pregnancy various Rh-positive cells from the fetus pass through the placenta into the maternal circulation. As a result of this the mother develops Rh-positive antibodies which agglutinate and destroy these foreign cells. These antibodies developing in response to the fetal cells gradually increase in amount during pregnancy and pass through the placenta into the fetal circulation, but the greatest transfer probably occurs during labor.[11]

If very high amounts of antibodies pass over to the fetus during pregnancy the fetus is usually stillborn with hydrops fetalis and severe anemia. If the amount is slight the child appears normal at birth and in the neonatal stage. If moderate quantities of antibodies pass over, the child usually appears normal at birth but develops anemia and jaundice during the immediate neonatal stage.

The maternal antibodies lead to the increased destruction of the red cells of the fetus with the resultant breakdown of hemoglobin and production of bilirubin. In general, the more antibodies that pass over, the greater the degree of anemia, the greater the bilirubin production, the greater the jaundice, and the greater the possibility of cerebral damage.

4. Infants show no evidence of jaundice at birth but these signs develop shortly afterwards. The reason for this may be based on the following chemical studies.

The original form of bilirubin (indirect) is altered in the normal individual to direct bilirubin by conjugation in the liver with two molecules of glucuronic acid. Indirect bilirubin cannot be excreted by the kidneys and in consequence accumulates in the blood and tissues. Direct bilirubin, on the other hand, can be excreted by the kidneys and also by the liver into the bile. Studies have shown that the enzyme essential for the conjugation of the glucuronic acid, glucuronyl transferase, is formed only in the liver and is not present in the liver of the neonate until the seventh to the fourteenth day. Because of this the original bilirubin cannot be altered to a form which can be excreted from the body and almost all the bilirubin formed during this period is retained. Jaundice is absent at birth because the direct bilirubin in the infant passes across the placenta and is conjugated and excreted by the mother or because enzymes from the mother pass across the placenta and conjugate the bilirubin in the fetus.[16]

Premature children show a greater delay in the development of these enzymes and are particularly prone to develop jaundice and kernicterus with hemolytic anemia.

5. Another factor associated with the clinical syndrome in the infant is that bilirubin can pass across the blood-brain barrier with greater facility than it can in the adult. Severe jaundice in adults seldom gives rise to kernicterus.

This may be due to two facts: (a) that the indirect bilirubin has a greater affinity for lipid material than direct bilirubin,[13] and (b) that the blood-brain barrier is more permeable in the infant than it is in later life. It has been shown that the injection of commercial bilirubin into the peritoneum of newborn rats[14] is followed by a pigmentation of the basal nuclei but the similar injection into adult rats is not followed by such pigmentation. Sulfadiazine and sulfisoxazole diminish the blood-brain barrier[12] and may be associated with kernicterus if given to premature children.

6. The actual damage to the cells by the indirect bilirubin is through the inhibition to oxidative phosphorylation and depression of the respiratory cycle.[13,15] This block in the Krebs cycle leads to nutritional damage of the cell and, if continued or severe, to necrosis.

The eventual changes in the cells would therefore correlate closely with the amount of bilirubin in the cells. It also appears that the degree of damage might be increased by such additional factors as elevated temperatures which increase the metabolic demands of the cells, inadequate oxygenation due to anemia, or hypoglycemia in the tissues associated with a low glucose intake.

Treatment.—Current treatment will be discussed with particular reference to the etiological factors previously discussed.

1. In order to prevent the passage of large quantities of antibodies across the placenta to the infant, it has been suggested that pregnancy be terminated before term. This proposal is based on the fact that the antibody titer in the mother rises rapidly toward the end of pregnancy. In this procedure, however, the increased sensitivity of the premature infant to bilirubin must be carefully balanced against the reduction in the antibodies. At the present time there seems to be general agreement that there is less danger of kernicterus if pregnancy is terminated 2 to 3 weeks before term.[16]

2. The next procedure is the removal as far as possible of the maternal antibodies in the infant. Since these are usually attached to the Rh-positive cells of the fetus, it means the removal of the Rh-positive blood of the infant with replacement by Rh-negative blood of the same type. The question of a replacement transfusion depends on the level of the bilirubin in the infant, and occasionally on his level of hemoglobin. If the bilirubin in the infant rises about 10 mg. per 100 ml. in the first 12 hours or 20 mg. per 100 ml. after that time, or if the hemoglobin falls below 10 Gm., then the replacement transfusions are carried out.[17] The child is kept under further observation, and if the bilirubin level rises to the critical point further replacement transfusions are carried out.

Various studies indicate that this is a highly successful procedure with a very marked reduction in the incidence of kernicterus.[18,19] Studies at the Hospital for Sick Children between 1947 and 1952 indicate that in children with erythroblastosis fetalis 4.9 per cent of the full-term infants and 6.9 per cent of the premature infants developed signs of kernicterus. Since replacement transfusion has been carried out it is felt that there has been a significant reduction in the incidence of kernicterus, particularly of those signs evident in the early weeks. Unfortunately, however, there has not been a full and critical evaluation of these children at a later date in order to determine whether there might have been any minor signs of damage to the central nervous system. A detailed neurological and psychological study in the preschool years is essential for a complete appraisal of the value of replacement transfusions.

3. There have been a number of other rather interesting attempts to prevent kernicterus. Steroids have been given to the mother in the hope that they would prevent the formation of the antibodies in cases of Rh incompatibility.[20] As yet no definite proof of effectiveness has been found for this procedure. Glucuronic acid has been administered to the infant to see whether this might facilitate the conjugation of indirect to direct bilirubin.[21] Again no definite proof of effectiveness has been found at the present time.

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FAMILIAL CEREBRAL PALSY

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THERE IS unanimity among all authors that cerebral palsy by no means constitutes an etiological, or even a morbid entity. Osler[1] gave to his monograph the title *The Cerebral Palsies of Children*, and Phelps,[2] too, uses the plural in his contribution to the *Mitchell-Nelson Textbook of Pediatrics*. On the other hand, however, the concept of cerebral palsy has turned out to be very useful for practical and theoretical reasons and it has become a rather well-defined group of syndromes. But this very question of definition has to be put forward when one is going to discuss any side of the intriguing problem of etiology, since there is no doubt that different causes can lead, in the central nervous system, particularly before, during, or immediately after birth, to an identical symptomatology. There are definitions by Molhave and Plum,[3] Benda,[4] Minear,[5] Leden and Krusen,[6] and many others which particularly exclude or almost exclude hereditary syndromes, among other features. From this one extreme there lead many transitional wordings to the other extreme, which simply states that all motor disturbances generating from the brain are to be included under the heading[7] cerebral palsy (this almost applies to the formulation of the American Academy of Cerebral Palsy). We should like to follow the line taken by Perlstein[8-11] and similarily by the Oxford symposium on cerebral palsy held last year.[12] These definitions run as follows: "Cerebral palsy is defined as a condition characterized by a motor deficit or defect—paralysis, weakness, incoordination, hyperkinesia or any type of motor aberration—due to involvement of the motor centers of the brain."[11] The author stresses furthermore that in most cases other disturbances are frequent, that he limits himself to the infantile cerebral palsy and that mental deficiency or epilepsy not complicated by other motor disturbances is excluded. According to MacKeith and collaborators[12] the definition runs as follows: "Cerebral palsy is a persistent but not unchanging disorder of movement and posture, appearing in the early years of life and due to a non-progressive disorder of the brain, the result of interference during its development. Persistence of the infantile type of motor control, such as may be seen in intellectually handicapped children, is not considered to be cerebral palsy." It is quite clear that these definitons do not exclude genetic factors as possible causes of cerebral palsy.

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Whereas in the earlier clinical descriptions perinatal and postnatal events prevailed as causing the different syndromes of cerebral palsy, during the last decade many facts and observations have been accumulated for shifting the stress in at least 30 per cent of all cases toward prenatal factors.[9,13] Even Little[14] in his famous publication made the annotation: "The condition may present itself as a congenital affliction or as a result of diseases during early infancy. Cerebral palsy is probably in most cases the result of variations in the structure of the brain."

It goes without saying that if familial and hereditary influences play any role in the etiology of cerebral palsy, they have to be classified with the prenatal factors. But, nevertheless, most of the authors doubt that genetic or inborn agents are of any major importance in the etiology of cerebral palsy syndromes and mention this possibility as either far-fetched or only incidental.[13,15-18] Even postmortem examinations are not always helpful[19,20]: it is very difficult, often impossible, to judge from the destruction of brain substance found at autopsy whether it has been preformed or has been the end result of prenatal or perinatal damage. The excellent clinical and experimental observations made by Courville[21,22,23] by Windle and co-authors,[24] by Buchner, Maurath, and Rehn,[25] and by many others, and the clinical experiences related by Anderson,[26] Eastman and DeLeon,[27] and Latham, Anderson, and Eastman[28] have put intrauterine anoxia and asphyxia in the center of the stage, as well as prematurity, the latter to be placed, for many reasons, among the prenatal factors too. Eastman[27] points out explicitly that it cannot be decided whether or not a genetic factor is involved in prematurity. Even so far as multiple births are concerned,[29-32] it is often assumed that the well-known tendency to prematurity in these deliveries constitutes the decisive element in the development of cerebral palsy syndromes. Phelps[33] has recently stressed the frequency of the midline defective development syndrome (often associated with cleft or high palate, clubfoot, microcephaly, mental deficiency, spasticity, or rigidity) in cerebral palsy which goes back to the initial period of embryologic life; the cause or causes are unknown, but the author assumes that genetic factors are of negligible importance. Even the frequent occurrence of cerebral palsy in siblings of the same stock does not prove endogenous familial hereditary causes, as the same disturbed mechanism[34] in utero may lead to manifestations of similar syndromes, labeled as cerebral palsy. On the other hand, the accumulation of cerebral palsy in one family, in different generations of the same family, and in siblings descendent from consanguineous ancestors, as already stressed by Freud[35,36,37] in his marvellous 70-year-old monographs dealing with cerebral palsy, suggests that in these families some genetic or familial factor is of definite influence in creating the various manifestations of cerebral palsy.

MATERIAL

During the last three years, we have seen 120 patients affected with cerebral palsy who were examined very thoroughly and whose histories have been taken carefully as far as this is possible with our fluctuating population of so many

countries of origin and different backgrounds. Among these 120 children, there were 16 in whom near relatives with identical or very similar affections could be detected, i.e., 13 per cent of all cases, comprising 8 families (Table I). Neither birth injury, nor any injury or any pertinent disease of mother during pregnancy, nor jaundice at birth had been mentioned in the history of any of these cases. All these families were Jewish, and most had immigrated to Israel—6 from the Near or Far East countries (Egypt, India, Morocco, Turkey) and one from Rumania. Only one family had lived for many generations in what was then called Palestine. Close consanguinity of the parents existed in 5 of these families; in one family (No. III, Case 5) there exists a kind of multiple consanguinity as can be seen from the family tree (Fig. 1). Microcephaly could be established in 5 of the cases. Eleven children were affected mentally, the majority to such a degree that chances of rehabilitation were extremely reduced. The type of affliction of the siblings was always the same and almost identical. Only one pair of siblings belonged to the extrapyramidal athetotic group (II, 3, 4), another 3 siblings showed extrapyramidal signs together with severe spastic quadriplegia (mixed type, IV, 6, 7, 8). One male child (VIII, 16) belonged to the atactic amyostatic type; in this family female members of at least 2 generations before suffered from a similar affection. All other patients were spastic, differing from each other quantitatively and qualitatively, and most of them displayed sensory, mental, and speech disturbances, too. In 2 families there were nonaffected siblings in the same generation; in only 2 patients was a normal electroencephalogram found; in 2 others the EEG examination could not be performed.

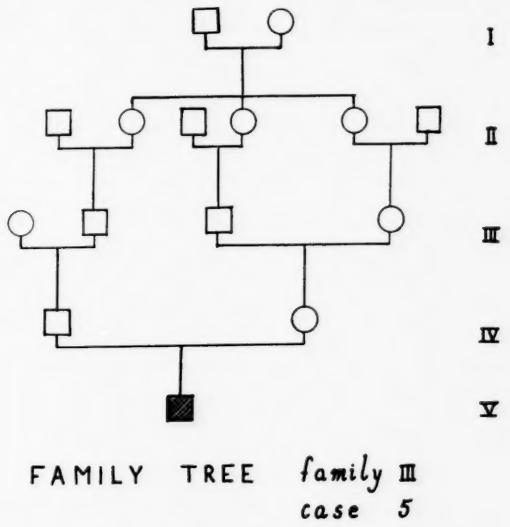

Fig. 1.

COMMENT

In 1952 Adler[38] described 2 families (not included in this presentation) with multiple cerebral palsy involvement and close consanguinity of the respective

TABLE I. MAIN FEATURES IN 16 FAMILIAL CASES OF CEREBRAL PALSY

FAMILY	NO.	BORN	SEX	CONSANGUINITY OF PARENTS	TYPE	SPEECH	SENSORY AFFECTIONS	MENTAL DEFIC.	NOT AFFECTED SIBLINGS	EEG	REMARKS
I	1	1952	M	0	Sp. Qupl.	Mute	Deaf	Severe	None	Abnormal	Microcephaly; strabismus
	2	1953	F	0	Sp. Qupl.	Disturbed	?	Severe	None	Abnormal	Decolorization of r. papilla, microcephaly; strabismus
II	3	1946	M	+	Athetotic	Disturbed	No	Medium	None	Abnormal	Obesity; gynecomastia; decolorization of either papilla
	4	1954	M	+	Atactic	Disturbed	No	Medium	None	Abnormal	Obesity; decolorization of either papilla
III	5	1955	M	+	Sp. Dipl.	Disturbed	No	Slight	None	Abnormal	See Fig. 1
IV	6	1940	M	+	Mixed Sp. Qupl.	Disturbed	Blind	Severe	2	Abnormal	Parents first cousins
	7	1943	M	+	Sp. Qupl.	Disturbed	Blind	Severe	2	Abnormal	Atrophy of either papilla
	8*	1945	M	+	Sp. Qupl.	Disturbed	Blind	Severe	2	Abnormal	
V	9	1943	F	+	Sp. Dipl.	Normal	No	Almost none	3	?	Parents: uncle and niece; *twins*
	10	1943	M	+	Sp. Dipl.	Normal	No	Almost none	3	?	
VI	11	1951	F	+	Sp. Qupl.	Normal	No	Normal	None	Normal	Cousin of 12
	12	1951	M	0	Sp. Monopl.	Normal	No	Normal	None	Normal	Cousin of 11
VII	13	1951	M	+	Sp. Qupl.	Disturbed	?	Idiot	None	Abnormal	Parents first cousins, all microcephaly
	14	1952	F	+	Sp. Qupl.	Disturbed	?	Idiot	None	Abnormal	
	15	1954	M	+	Sp. Qupl.	Disturbed	?	Idiot	None	Abnormal	
VIII	16	1957	M	0	Ataxy, tremor hypotony	Disturbed	Deaf	Slight	None	Abnormal	Mother, aunt, grandmother, same affection

*Died at the age of 5 years.

parents. In the first family, with 11 children (all alive), 4 had a definite severe clinical spastic cerebral palsy, whereas 3 other siblings had definite subclinical neurological abnormalities. In the second family the mother had shown clinical spastic signs and tremor from childhood; the propositus, whose male twin died at birth, was severely affected with spastic and mental signs and, in addition, with apparently peripheral nerve involvement in the upper extremity, 5 children (including the above twin) had died immediately or early after birth and the 4 remaining siblings displayed subclinical spastic disorders.

Almost all authors agree that spastic paraplegia (spinal spastic paralysis[39]) and congenital tremor[47,48] are hereditary, and there are many descriptions of this in the ample literature on the subject.[40-46] Moreover, microcephaly has been rather often included among the hereditary group, showing mostly a bad prognosis.[49-51] But in applying strict criteria we could not classify any of our 16 cases under these above headings, since even in the 3 cases (III, 5; V, 9, 10) with diplegia, heredity was not conspicuous at all. On the other hand, consanguinity of the parents has been established beyond any doubt. The same holds true for the patients with microcephaly, except in the one case of atactic amyostasia in our small group (VIII, 16), where heredity had to be assumed as a factor from the family history. This does not mean that a hidden genetic factor has not been involved in the other families as well, since we were not able to examine most of the other members of the respective families, and since genetic studies are difficult, complicated, and full of pitfalls. There are numerous papers dealing with the possibility of the involvement of genetic factors (including supposed agenesis of parts of the brain), some of them at least leaving this question open to discussion.[8,9,18,52-60] Some[32,55,61,64] deal with multiple occurrence in the same family; in particular Blumel and her colleagues[61,64] are concerned with this problem. Other papers[62,63] have only partial explanations for very severe damages to the brain and, therefore, hereditary and genetic factors have to come into consideration, too. Consanguinity of the parents is also discussed in the literature, partly positively and partly with some doubt with regard to its importance.[35-37,65-67] A few papers deal with postmortem examinations.[19,20,68,69,70] Towbin[69] assumes that 25 per cent of all cases are caused by genetic disturbances. The factual evidence of our unselected but relatively small collection of cases of cerebral palsy supports the view that there is a rather high familial incidence in cerebral palsy syndromes, perhaps more in the oriental communities. Furthermore, consanguinity of parents (and/or ancestors) is frequently found in these cases. This fact suggests that in prenatally caused cerebral palsy some genetic factor, maybe in connection with other conditions, is of certain etiological influence, a view at least not denied by most of the authors[8,9,18,32,52-70] quoted above. Here arises the question whether this experience satisfies our theoretical curiosity alone or whether there are practical implications as well. Although the latter may be, for the time being, of minor importance, two features seem worth stressing, without overlooking the utmost necessity of evaluating each individual case of cerebral palsy according to its own medical and paramedical merits: (1) The majority of familial cases are less prone to successful rehabilitation. This should be borne in mind when appropriate cases are assessed and selected for intensive

treatment and rehabilitation, particularly with regard to the economic situation of the families and countries involved and to the danger of nourishing illusions in parents of children in whom the outlook for the future is not promising at all, to say the least. (2) Eugenic prevention should be offered by encouraging the population to avoid consanguinity of parents.

SUMMARY

1. Some of the definitions of cerebral palsy accepted in this paper do not exclude hereditary and familial cases.

2. Prenatal causes are occupying a steadily growing part in the etiology of cerebral palsy syndromes.

3. Among 120 thoroughly examined patients with cerebral palsy there were 16 children (8 families) with near relatives affected; in 5 of the families consanguinity of the parents was found.

4. Familial and probably genetic factors play, therefore, a certain role in the etiology of cerebral palsy.

5. This fact may have some practical implication for rehabilitation as well as eugenic considerations.

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PARKINSONISM

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THERE IS nothing more compelling than the picture of the patient with advanced Parkinsonism. The classical tremor and rigidity progresses relentlessly until he becomes helplessly dependent for feeding, dressing, and eventually for almost every simple human activity. Yet, beneath that fixed, rather stupid expression, there is a mind, usually fully alert, but subdued into a quiet philosophy of stoical acceptance by prolonged and increasing disability. It is not hard, therefore, to understand the intense interest of the physician and surgeon in this disease. From the days of Parkinson's original observations, research has been pursued vigorously and has been particularly fruitful over the past ten years.

The pathologic manifestations of the condition are now better understood, but the disturbed physiologic mechanisms underlying rigidity and tremor still remain somewhat obscure. However, as a result of demonstrated lesions in the globus pallidus, substantia nigra, and red nucleus, one can assume that there is an abnormal neural circuit within the central nervous system that causes tremor and rigidity. Nevertheless, we are by no means certain how these lesions determine the clinical picture or the speed of deterioration of the patient.

Treatment by drugs such as hyoscine, phenobarbital, Artane, and many of the other more modern proprietary anti-Parkinsonism medicines relieves muscular rigidity for a while and occasionally modifies tremor, but the disease usually progresses undeterred. Modern surgical treatment now developed relieves rigidity and tremor suddenly and restores facility. The facial mask is stripped away, revealing a stoical, often intelligent, and humorous person, whose joy at being even partially relieved is indeed a rich experience for those who witness it.

Early attempts by surgeons to relieve these symptoms were necessarily empirical. At first they were largely confined to the creation of destructive lesions

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in some part of the pyramidal tract. This was dependent on the first observation of Parkinson in 1817 that tremor disappeared when the patient developed a capsular hemiplegia. During the past thirty years many operations of this type have been described, for example, the extirpation of the precentral region of the cerebral cortex, destruction of part of the internal capsule, cerebral peduncle, and the posterior and lateral columns of the cervical part of the spinal cord. Many of these operations were moderately successful in relieving tremor, but there was, of course, some residual paralysis and sometimes incapacitating spasticity.

It was Russell Meyers in 1942 in New York who changed the direction of our thinking by the thesis that interruption of the fibers emerging from the globus pallidus might modify the tremor and rigidity of Parkinsonism, and his early open operations designed to interrupt these pallidofugal fibers were encouraging, although somewhat hazardous. In 1950 Fénélon in Paris described an improved operative approach. Through a frontal craniotomy he followed the optic tract backward beneath the frontal lobe to a point just posterior to the anterior perforated substance. There he was able to insert an electrode upward into the globus pallidus and make a small destructive lesion of about 1 cm. diameter with electrocoagulation. The results were most encouraging, although the operation was not without some danger, and soon others, including ourselves, confirmed that here at last was a great step forward. Although tremor and rigidity in the opposite limbs were considerably reduced and even eliminated in some patients, the most exciting observation was that many of them also improved generally. They regained poise, emotional expression, energy, and zest for life, put on weight, and became more physically and mentally independent. Our first patient, operated on by the Fenelon approach in March, 1955, in Edinburgh, had not worked for 10 years and was confined to bed several days a week. After operation he resumed light work and was no longer partially bedridden. Now, some 5½ years later, he maintains the improvement in rigidity and tremor and in well-being.

Beneficial though these operations were, they were necessarily prolonged and taxing on the patient, for they had to be done under local anesthesia, but it was not long before they were replaced by simpler and less hazardous methods. As far back as 1873, in pursuit of the definition of fiber tracts and their functions, small localized lesions were made by Dittmar in the midbrain of the rat with a small knife attached to a guiding apparatus. From that time onward cerebral and spinal function in animals has been investigated in this way by physiologists by increasingly accurate methods, using the localized low-voltage electrical stimulus and destructive lesions and more recently by electroencephalographic recording. By 1920 Horsley and Clark in Britain had evolved their methods to a remarkable degree of accuracy. It is to them and to Clark in particular that we owe the greatest developments and the ultimate application of this surgical method to man. However, Spiegal and Wycis in Philadelphia were the first to develop a stereotactic apparatus for use in the human; they published their results of treatment in 1947 and 1952. Now, thirteen years later, there are many different types of apparatus in the world, some more complex than others. Notable

contributions have been made by Talairach, Leksell, Guiot, Cooper, Reichert, and Bertrand.

For the localization of the invisible deep ganglia of the brain, and in particular the globus pallidus and thalamus, all rely upon the visualization of neighboring structures bearing a reasonably constant relationship to them. These, especially the anterior and posterior commissures, are shown by air encephalography or positive contrast ventriculography.

The accumulating information from these various operative procedures has supported Myers' original concept and observations. It would now seem that the strategic interruption of the pallidofugal fibers, the ansa and the fasciculus lenticularis, is an effective surgical means for the alleviation of rigidity and tremor in Parkinsonism, and the involuntary movements of some of the dyskinesias.

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What is not yet clear is the ideal site and size of a lesion which will give maximum relief and sustained improvement. Initially, following the work of Fenelon, Guiot, Cooper, and others, it appeared that a lesion in the globus pallidus and adjacent ansa lenticularis was the ideal. However, as time went on it was apparent that tremor was less easily abolished than rigidity and it often returned as a rest tremor a few months after operation. In 1955, Hassler of Freiburg suggested that a lesion in the ventrolateral nucleus of the thalamus would be likely to abolish tremor more effectively; this has been borne out by the work of Reichert, Cooper, and others.

The evolution of surgical treatment of the disease in Edinburgh began in March, 1955. Over a period of 5½ years we have been able to study the effect of electrocoagulation lesions in the globus pallidus, internal capsule, and thalamus, separately or in combination, in a series of 126 patients. Before treatment each patient was systematically assessed as to neurological and intellectual functions and emotional state by the neurosurgeon, neurologist, and medical psychologist of the team. Similar detailed studies were made during and after operation. The surgeon and radiologist were jointly responsible for the combined surgical and radiologic procedures, and for plotting of the site and extent of the lesions on stereotactic and anatomic charts in each case. Thus we have been able to correlate the clinical results and side effects with the site of the lesion. The charts were first based on the atlas of Spiegal and Wycis (1952) and recently on that of Schaltenbrand and Bailey (1959). Finally, an extended follow-up of up to 5 years and not less than 6 months has been carried out along the same lines, embodying the reports of patient, close relative, and attending general practitioner.

The first 60 patients formed a consecutive series and were unselected, apart from the imposition of an upper age limit of 65 years.

The operative stereotaxic method used was that originally described by Guiot but modified both in method of application and apparatus.

From the beginning our policy was to create as small a lesion as would be compatible with maintained improvement, not only to avoid side effects, but also that we might study the effects of disruption of cell stations and fiber connections as accurately as possible and determine the site of an effective lesion.

Low-voltage bipolar stimulation in these structures and in the internal capsule during operation was carried out under local anesthesia, and then lesions were made by monopolar electrocoagulation.

Thus the evolution of surgical treatment in Edinburgh has been dependent upon the correlation of the results of treatment and the site of lesion as shown by anatomic study and the results of stimulation.

From April, 1957, until July, 1958, lesions were made in the globus pallidus, 17 mm. from the midline. In some of this group, in which tremor predominated, the best results, that is the elimination of tremor as well as rigidity, followed a lesion in the globus pallidus and ansa lenticularis, or globus pallidus and adjacent internal capsule, or a lesion which included all these sites. When rigidity predominated, a lesion in the globus pallidus between its medial and lateral parts almost invariably gave good results. The failure to abolish tremor completely, or the recurrence of rest tremor after some weeks, led us to adopt the suggestion of Hassler (1955) that a lesion in the ventrolateral nucleus of the thalamus might abolish tremor more effectively. Seven of 25 patients originally treated by lesions in the globus pallidus had an additional lesion made in the ipsilateral thalamus with abolition of persistent rest tremor. As a result, in the second phase, from August, 1958, to January, 1959, 14 patients were treated by thalamic lesions only, these being made in the ventrolateral nucleus adjacent to the capsule, 16 mm. from the midline. Tremor was successfully abolished or greatly reduced in many more patients than previously, but rigidity did not resolve as completely as with lesions in the globus pallidus. Therefore, in the third phase, from February, 1959, to June, 1959, double lesions on the same side, one in the thalamus and one in the globus pallidus, both adjacent to the internal capsule, were made with further improvement of results and without increasing morbidity. By lowering the trajectory of the track of the electrode 2 to 3 cm. below that advocated by Guiot (1958), both lesions could be made with the same track. Finally, in May, 1959, the possibilities of a different type of lesion became apparent. Tremor in one patient was difficult to eliminate, but by adjusting the position of the electrode in the sagittal plane several times, using low coagulation current, we abolished tremor without the appearance of side effects. On charting his lesion we found that it was narrow and elongated, commencing in the thalamus, almost completely transversing the capsule and ending in the globus pallidus 16 mm. from the midline and parallel to it. There were no neurological deficits. Tremor and rigidity in the contralateral limbs were abolished and facility restored. Surprisingly, perhaps, yet of considerable importance, transient disturbances of consciousness which had occurred many times a day for some years before operation and which greatly interfered with his contact with others, disappeared and have remained absent for 18 months to date. This experience has led to further pursuit of this type of lesion in 2 other more recent cases of bilateral Parkinsonism. Both were successfully relieved, but one has the complication of minor paresthesias affecting the angle of the mouth and the tips of the thumb and index finger of the hand of the opposite side.

From these experiences it would seem that tremor and rigidity are controlled most effectively by the strategic interruption of the thalamopallidal

connections, essentially the ansa and fasciculus lenticularis. Whether this can best be achieved in the capsule by a relatively small lesion or in the adjacent thalamus and globus pallidus is not yet clear. Certainly large lesions of the capsule in this area are followed by major deficits of motor, sensory, and language function, the last if the lesion lies in the dominant hemisphere. Fortunately, we have usually been able to avoid such lesions.

In the first 60 unselected patients, 53, or 88 per cent, have had tremor and rigidity abolished or significantly reduced in the treated limbs without complications. Six, despite successful treatment of tremor and rigidity, have persisting though receding complications which arose in the early days of development of the stereotactic work because of misplaced or large lesions. One patient showed no benefit from operation. There were no immediate operative deaths but 3 patients subsequently died, 2 from bronchopneumonia several months later and one from suicide following fracture of the femur.

The subsequent 66 patients have shown a minor degree of selection, essentially on the basis of age. Most were treated by combined ipsilateral lesions in the thalamus and pallidum adjacent to the internal capsule but 8 have had deliberate lesions within the capsule, 15 mm. from the midline. All showed benefit, some dramatically. Sixty, or approximately 90 per cent, were greatly relieved. Complications were minimal; a few patients showed a temporary impairment of sensation over the contralateral thumb and index finger and perioral region. There were no operative deaths but 2 patients died subsequently, one suddenly almost a year later from unknown cause and another, a few weeks later, of coronary thrombosis.

In the over-all series of 126 patients, 22 have had bilateral lesions, the second hemisphere being treated usually several months later. However, more recently this interval has been shortened to about one month. Only the first 3 showed some psychologic impairment from large lesions and the remaining patients have shown little such disability, some having had bilateral pallidal and bilateral thalamic lesions.

As a result of our experience we believe that selection of patients is desirable and should be governed by the degree of widespread manifestations of Parkinsonism judged preoperatively. Where widespread manifestations are present, surgical lesions to treat tremor and rigidity cannot be large or inexactly placed, or mental deterioration characterized particularly by akinesis will be accentuated. Similarly patients over 65 should be accepted with diffidence because of the dangers of increasing the intellectual deterioration associated with the aging brain, no matter how slight the deterioration may appear.

Nevertheless, results are still somewhat unpredictable and the most dramatic response is occasionally seen in the most disabled. Some of the effects of operation are surprising—the return of poise, emotional expression, well-being, and restoration of weight; the relief of intractable pain from muscular rigidity, not infrequently diagnosed as sciatica or brachialgia or lumbosacral strain; the occasional restoration of concentration and the ability to follow complicated conversation; and restoration of confidence so that important decisions can again be taken easily. What we do not yet know is whether or not we can delay or even

halt the progress of this relentlessly progressive disease. There are indications that we may be able to do so by strategically placed lesions of adequate size. Indeed the results are largely dependent upon this fundamental point and upon whether or not we can overcome the problems of the individual variation from one brain to another. Longer follow-up is obviously necessary.

On the other hand, there are as yet some aspects of the disease we cannot help appreciably; the oculogyric crises, loss of voice volume, the festinant gait, and excessive salivation. However, bilateral lesions appear to be solving some of the problems of gait and in some cases voice volume has improved by about 10 per cent.

I have spoken at some length about the surgical management of this problem but there is of course much to be said about ancillary therapy and, in particular, physiotherapy and occupational therapy. Much has to be done toward the correction of ingrained bad habits due to rigidity in posture, gait, and the finer movements. There is also in some patients a tendency to neglect the improved limbs for a while. The success of this work requires, as is so often the case, the combined effort of the team.

Many of you will surely agree that in recent years there has been little more exciting, rewarding, and inspiring than this great step forward in what seemed a rather hopeless field.

This paper is based on the work of a team including Dr. W. S. Watson, Dr. A. A. Donaldson, Dr. J. Naughton, and Dr. A. A. Maloney, and it is my pleasure to acknowledge them.

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PROBLEMS OF REHABILITATION OF THE LEPROSY PATIENT IN A HIGH PREVALENCE AREA OF AFRICA

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TEN to fifteen million persons in the world are suffering from leprosy, more than two million of these in Africa, and approximately 300,000 in the Republic of the Congo (formerly Belgian Congo).

There are in the Congo 72 leprosaria treating about 16,600 patients on an inpatient basis; the remainder, 270,000, were being treated at 2,700 outpatient centers in June, 1960.

Missionaries have been treating leprosy in the Congo for many years. Many of you know of Dr. Kellersberger of the American Leprosy Missions, who was medical superintendent at one of the largest leprosaria, Bibanga, for three decades or more. Since 1953, the Government, operating through FOREAMI, has undertaken antileprosy work on a large scale, supplementing, coordinating, and extending the the voluntary work, at a cost of many millions of dollars. At the Yonda Leprosarium in the northwest, near Coquilhatville, a Roman Catholic mission institution operating with financial aid from the Government where we were from 1953 to 1960, there are approximately 850 patients. According to information recently received, treatment is being continued by nurses. Outpatient treatment in rural areas has probably been disorganized and may have to be abandoned. Although the immediate future of these leprosaria and clinics cannot be predicted, we must assume that the treatment of leprosy will be continued, or resumed, after the current political difficulties are settled.

Although the sulfones are in no sense wonder drugs—in fact they are extremely slow in their action—there is a good prospect of arrest of leprosy if treatment can be maintained for a sufficient length of time. At Yonda, bacteriologic negativity and arrest of the active process have been attained in about one-half of the cases within 5 years. A large proportion of the remaining patients have shown clinical and bacteriologic improvement. A new drug, ethyl mercaptan (Etisul) was under trial at Yonda and gave promise of being more rapidly effective than the sulfones.

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The arrest, even the cure, of the active disease does little to remedy the physical disabilities which are the sequelae of leprosy. The best that we can do with chemotherapy in most cases is to convert an infectious cripple into a healthy one.

Fig. 1.*—Distal absorption of the fingers and metacarpophalangeal osteoarthritis. (Copyright Editions Arscia S. A., Bruxelles.)

Fig. 2.—Notching of the tip, first step of distal absorption. (Copyright Editions Arscia S. A., Bruxelles.)

There are two reasons for this. In the first place, the patients usually seek treatment after the disease has been present for months or years. Sometimes delay is unavoidable; it is the evidence of nerve damage—anesthesia in particular—which attracts the patient's attention. In many instances, however, there are contractures of the fingers or toes, extensive anesthesia of the extremities, ulcera-

*Figures reproduced from *Études des mutilations lépreuses*, by M. Lechat, with the collaboration of J. Chardome, Paris, 1961, Masson et Cie, Bruxelles, Arscia S. A.

tion and absorption of the small bones of the hands and feet—all indicating that the disease is of long duration. Second, the effect of the sulfones on nerve and bone damage is limited. There is probably a good effect on lesions such as cysts which are caused by the invasion of the bone marrow by the leprosy bacillus, but these constitute a minor part of the bone conditions. The usual atrophy of bone is caused either by destruction of the vasomotor nerve fibers and lessening of blood supply or, as Brand in particular has emphasized, by secondary infection following injury of sensationless hands or feet. At Yonda, repetition of x-ray examinations after intervals of 7 to 72 months showed continuation of the absorptive

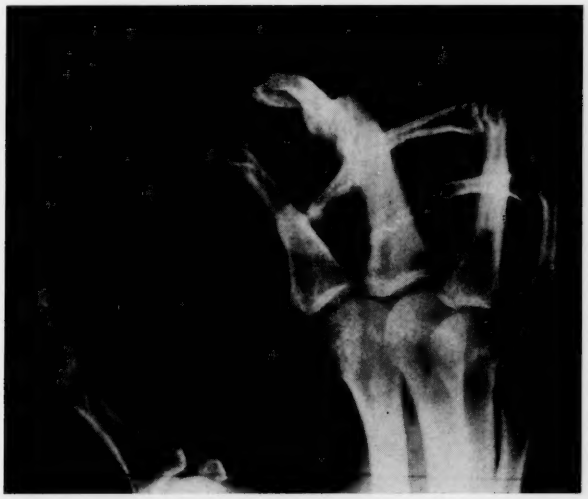

Fig. 3.—Clawhand; distal absorption. (Copyright Editions Arscia S. A., Bruxelles.)

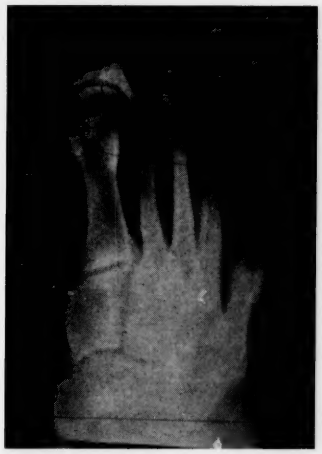

Fig. 4.—Absorption of the toes and metatarsophalangeal osteoarthritis; osteitis corresponding to a perforating ulcer. (Copyright Editions Arscia S. A., Bruxelles.)

process in bones of the hands and feet although the patients had been on sulfones for a minimum period of 2 years before the first examination.

The lesson from both of these reasons is that we should try to reach the patients by education and propaganda earlier in the course of the disease.

It is in the leprosaria that the great backlog of disabled patients has accumulated and it is there that the rehabilitation process must commence. This is especially applicable to the Congo where every leprosy patient with disability had the right to maintenance at public expense in a leprosarium. The commonest cause of serious disability at Yonda as in most other large leprosaria is the plantar ulcer, from which more than one-fifth of our patients suffer. Other serious causes, such as amputations, foot drop, and extensive contractures bring the total proportion of disabled to about 40 per cent of all patients. Figs. 1 to 7 illustrate the types of disability that have been encountered among our patients. These are not peculiar to the Congo; the various types occur everywhere, although they differ in their relative frequency in different countries.

Fig. 5

Figs. 5 and 6.—Distal absorption of the toes; osteomalacia of the fifth metatarsal bone; intermetatarsal bridging. (X-rays repeated at 23 months' interval in a sulfone-treated patient.) (Copyright Editions Arscia S. A., Bruxelles.)

Dr. Doull has stated that it has been widely assumed that rehabilitation in leprosy is beyond the financial capacity of certain countries. It is true that buildings and equipment are costly and that skilled orthopedists and physiotherapists are difficult to obtain. There are, however, many simple measures that are useful and inexpensive. Among these are: (1) early treatment of wounds and burns of

the insensible hand or foot; (2) the use of oil massage and of the wax bath for the atrophied and palsied hand; (3) active and passive exercise of the hand; (4) progressive stretching and splinting of the fingers; (5) splinting of the swollen fingers during reactions so that if stiffness results the fingers will be in a good functional position.

Although simple and inexpensive, the application of these measures requires, in the first place, accurate diagnosis and selection of suitable cases and, second, instruction of those who are to do the work. It has been possible to carry out these measures at Yonda on a large scale under direction of a leprologist, who obtained his special knowledge from visits to several centers in the world under the auspices of a fellowship received from WHO. At first, only locally trained personnel were available for physiotherapy; later, a professional physiotherapist was obtained from Belgium and more complicated procedures were undertaken, especially treatment of selected patients by electrotherapy. Prior to 1959 it was necessary to transport the patients about ten miles to Coquilhatville for x-ray studies. In 1959 x-ray equipment was installed, an operating room was equipped,

Fig. 6.—For legend, see opposite page.

and a second surgeon was obtained. The first attack was made on the plantar ulcer of the foot. Of 70 patients in whom the ulcers had been torpid for one to 3 years, healing was obtained in 67.

To the African patients, most of whom are agriculturalists, the repair of the foot is perhaps more important than that of the hand. There have been few cases

at Yonda in which a complete amputation of the foot has been necessary. About 400 patients with plantar ulcers, mutilations of the hands or feet, or contractures of the fingers were x-rayed during our tenure at Yonda. Bone absorption of the small bones was present in a high proportion, as has been found elsewhere. We were surprised to find a high frequency of osteoarthritis of the metarsal-phalangeal joints.

Fig. 7.—Metatarsophalangeal osteoarthritis without absorption of the toes. (Copyright Editions Arscia S. A., Bruxelles.)

Hand surgery in leprosy is more difficult, more time consuming, and requires more aftercare than the usual surgery of the foot. Little has been done in this field at Yonda, but plans were well under way for periodic visits by an orthopedic surgeon, with the cooperation of the Institute for Tropical Medicine in Antwerp.

Occupational training has been an essential part of the Yonda program since the establishment of the institution. For this aspect of the work in particular, financial help was received from the Père Damien Foundation (FOPERDA). More and more care has been taken to fit the occupation to the physical capacity of the patient and to his rehabilitation. All of the construction and repair work at the leprosarium is done by patients who are paid at the same rates as healthy persons are paid for comparable work outside. Many discharged patients are employed in Coquilhatville and other places—as carpenters, masons, electricians, photographers, and clerks. There are many who are severely crippled and must

remain within the institution. Articles made by them are allowed to be sold outside. These include baskets, chairs, and curios.

Education of the children at Yonda is carried on by patient-teachers possessing the same qualifications as teachers in the regular school system. Evening classes in reading, writing, geography, and other subjects have been attended by about one-third of the total adult population, the teachers being their fellow patients.

To develop the potentialities of Yonda as a rehabilitation and teaching center rather than one for segregation and the possible extension of rehabilitation work to the outpatient clinics operating throughout the Congo, measures have been taken to convert the Yonda Leprosarium into an International Inter-African Center for the Rehabilitation of Leprosy Patients. Here is an example of what might be done in other places with the cooperation of voluntary agencies.

There is an opportunity for governmental international organizations to help in leprosy rehabilitation. The World Health Organization could assist in the leprosy rehabilitation problem in several ways: (1) by providing facilities for training of surgeons and physiotherapists in a few selected leprosaria in different parts of the world; (2) by making recommendations to governments, from time to time, concerning surgery and rehabilitation as they apply to leprosy patients; (3) by assisting governments which desire such assistance in setting up a model rehabilitation program for leprosy patients.

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THE SPEECH BEHAVIOR AND LANGUAGE COMPREHENSION OF AUTISTIC CHILDREN

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RECENT literature has revealed an increasing interest in the problems of the nonverbal child, of whom the autistic child is one type. This is a report of clinical observations of the autistic children in a residential school.* Twelve children were observed over a two-year period. Those observations disclosed various levels of speech usage. It was observed further that the children's level of comprehension of the spoken language of others greatly exceeded the level of their communicative use of speech. In addition, it was observed that each child exhibited some nonautistic behavior, behavior indicating awareness of and contact with his environment.

The clinical observations suggested that a systematic study of the children in a residential situation might produce data leading to a better understanding of autism. It was obvious that descriptive studies of autistic children would be necessary before any controlled experimental studies could be undertaken. However, the highly variable behavior of the autistic children precluded the use of formal testing procedures. In addition, no behavior rating scales that could appropriately describe the details of the behavior of autistic children were available. This lack of appropriate test material also applied to the speech behavior and language comprehension abilities. It was therefore decided to undertake a pilot study to explore the feasibility of objective measurement of the speech behavior, language comprehension, and relationship to the environment, of children designated as autistic. Emphasis was placed upon the exploration of tools of measurement, rather than upon definitive description of the behavior of the children.

Since it is impossible to construct a situation which would definitely elicit speech from autistic children, it was decided to attempt continuous tape recordings of regular therapy sessions with the expectation that speech samples could be obtained. Each child has daily sessions with three different therapists; an educational therapist, an occupational therapist, and a music therapist. All therapy sessions are under the supervision of a consulting psychiatrist.

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At different times, the microphone of a tape recorder was mounted inconspicuously on the wall of each therapy room, with the tape recorder in an adjacent room. Entire therapy sessions were tape recorded. The recordings contained primarily the verbalizations of the therapists or long periods of silence, with occasional samples of the child's speech. Recording in each case was continued until an adequate sample was obtained. The samples were then analyzed to obtain a description of each child's speech.

SUMMARIZATION OF ANALYSIS OF TAPE RECORDINGS OF THE SPEECH OF FIVE AUTISTIC CHILDREN

Child 1.—The speech of this child consisted largely of vocalizations rather than words. When engaged in activities in occupational therapy, the child might repeat such syllables as "um, um, um," "dum, dum, dum, dum" or "bum, bum, bum." Repetitions were similar to babbling, but the number of vowels was limited to two. Consonants were limited to *w*, *m*, *p*, *b*, *d*, *k*, *g*, sounds which are relatively easy to articulate, and which develop early in the life of normal children.

Much of this child's babbling varied in pitch, with each phrase of babbling consisting of a rising, then falling, intonation pattern.

When the educational therapist used pictures of animals, the child attempted to report the names of the animals. However, his articulation ability was limited to the vowels and consonants listed above. Similar articulation difficulties were noted when he repeated the names of letters after the therapist, even though he could discriminate visually between the letters. This child has learned to match printed words to appropriate pictures, so that some concepts of language have been developed. However, he uses speech only to name pictures in imitation of the therapist and does not use speech in any other communicative manner. His level of speech usage is extremely infantile in vocabulary and accuracy of articulation.

Child 2.—In sessions with all three therapists, this child vocalized considerably. However, the vocalizations were uncommunicative in nature and seemed to be more related to pleasurable self-stimulation. The vocalizations were limited to repetitions of such syllables as "duh, duh, duh, duh, duh," or similar repetitions of the syllables "yuh," "tuh," "dee," or "tee." Only four consonants combined with one of three vowels constituted this child's articulation of the speech sounds. Whenever a syllable was used, it was repeated many times before a different syllable was spoken.

The vocalizations of nonsense syllables followed definite melodic and rhythmic patterns. Occasionally, a familiar tune was recognized, but usually the vocalizations appeared to be tunes of the child's own composition. There was obvious enjoyment in the repetition of the melodic and rhythmic patterns and in the development of new patterns.

Child 3.—The limited amount of speech used by this child was extremely inconsistent. At times there was unintelligible babbling; at other times, complete phrases were spoken with accurate articulation of all speech sounds. Usually, however, the phrases were echolalic repetitions of the last words of a statement

by the therapist. Volume of voice varied from a shout to a whisper; rarely was the speech communicative. The size of the vocabulary of the echolalia was substantial, however, and included accurate articulation of most of the sounds of American English.

Child 4.—This child's speech was similar in many respects to that of Child 3, although there was a greater quantity and more communicative use of speech. Child 4 had learned to count, and would continue counting if the therapist started a series of numbers. The child's articulation was accurate in counting and also in singing the words of songs and rhymes begun by the therapist. Practically all of this child's speech was rote repetition of number or letter sequences, songs or rhymes. In only two instances on the tape recordings did the child make requests of the therapist. In each case, a short phrase was used, with accurate articulation. This child has apparently developed a sizable vocabulary with accurate articulation, but rarely uses speech to communicate his own ideas or needs.

Child 5.—This child's speech is composed of complete sentences, with accurately articulated speech sounds, but the sentences are completely irrelevant to the situation. This irrelevant speech was observed in autistic play as well as in the tape-recorded therapy sessions.

LANGUAGE COMPREHENSION

The behavior of autistic children precludes any formal testing of language comprehension. Therefore, it is necessary to depend upon the observation of therapists in their daily contacts with the children. A tentative rating scale was developed in order to estimate the level of language comprehension of autistic children. The items of the scale are questions which may be answered by observation of the children, and were designed to explore certain aspects of auditory discrimination of environmental sounds, response to gestures, and response to music as well as to various aspects of spoken language.

Tentative Scale for Rating Certain Aspects of Language Comprehension in Autistic Children

Instructions.—Observe the child in your contacts with him. Check each item for which you can answer "Yes." Make more than one observation so that you have some confidence in your answer.

I. *Discrimination of sounds:* Can the child recognize any of the following specific environmental sounds?

1. Lunch bell
2. Telephone
3. Whistling
4. Dog barking
5. Radio static
6. Noises of toys
7. Clapping
8. Fire or police siren
9. Car approaching
10. Car horn

II. *Awareness and comprehension of spoken language of others:*

11. Does the child show an awareness that someone is speaking?
12. Can the child distinguish the speaking voices of specific adults?
13. Can the child distinguish the voices of specific children?
14. Does the child recognize difference in the emotional tone of the speaking voice?
15. Does the child recognize his own name when called?
16. Does the child recognize the names of specific adults or children?

17. Does the child recognize the names of actual objects?
18. Does the child recognize the names of actual pictures?
19. Does the child recognize verbs as walk, run, jump, etc.?
20. Does the child recognize the names of colors?
21. Does the child understand words which express spatial relationships such as up-down, in-out, etc.?
22. Does the child understand words which express time relationships such as early, late, etc.?
23. Does the child understand number concepts?
24. Does the child understand simple phrases and sentences where comprehension of more than one key word is required?
25. Does the child follow verbal suggestions?
26. Does the child obey verbal commands?
27. Will the child listen to a story told by an adult?
28. Will the child listen to a story read aloud by an adult?
29. Does the child recognize differences in a story retold incorrectly?
30. Does the child anticipate parts of the story?

III. *Awareness and comprehension of certain aspects of visual language:*

31. Does the child respond to directions given by gestures?
32. Does the child recognize different geometric forms?
33. Does the child recognize different letters?
34. Does the child recognize different written numbers?
35. Does the child recognize different pictures?
36. Can the child recognize printed words which are the names of objects or people?
37. Can the child recognize printed words that name actions?
38. Can the child recognize abstract words?
39. Can the child read phrases?
40. Can the child read sentences?

IV. *Response to music:*

41. Does the child recognize music?
42. Does the child distinguish between the singing voice and the speaking voice?
43. Does the child distinguish between vocal and instrumental music?
44. Does the child distinguish different instruments?
45. Does the child distinguish between live and recorded music?
46. Will the child watch television or movies?
47. Can the child recognize specific melodies?
48. Can the child distinguish different rhythms?
49. Does the child react differently to familiar as opposed to unfamiliar tunes?
50. Will the child listen to music for a longer period than storytelling?
51. Will the child perform actions suggested by the lyrics of a song?

The tentative language scale was used by the three therapists who see the the children daily, both in therapy sessions and at the noon meal. The therapists followed the instructions and checked those items for which they observed a response. None of the therapists had an opportunity to observe the child's responses to all items of the scale, but each item was observed by at least two of the three therapists.

The observed autistic children exhibited definite ability in certain aspects of language comprehension. They were able to discriminate environmental sounds and voices of adults. They were able to recognize the names of people, objects

and actions. However, comprehension of abstract or complex language expressed in sentences was less noticeable. Response to written language was extremely limited, except in the case of one child who had developed the ability to read words by matching them with pictures. This child had limited response to environmental sounds and none to music. All other children exhibited considerable interest in and response to musical sounds.

It should be pointed out that two of the three therapists had worked with the children for more than a year before using the rating scale, and thus knew them very well. Although the rating scale items were only crude measures of language comprehension, the ratings of the therapists were reasonably consistent.

It is apparent that a rating scale can be used for a descriptive study of the language comprehension of autistic children. Expansion and refinement of the scale is definitely indicated. It is also possible that the therapists may be able to arrange some of the therapy sessions in order to obtain more valid observations of specific items.

RELATIONSHIP TO ENVIRONMENT

The therapists and the recreational and nursing staff of the school prepare daily reports on each child, using especially designed report forms. These reports are periodically discussed with the consulting psychiatrist. The report forms permit the recording of daily observations of the following items of behavior: mood, dressing, washing, eating, play, sleep, response to requests, response to commands, response to affection, response to disapproval, relationship to other children, attention span, word study, speech, picture study, music, arts, and crafts. The reporting procedure uses code symbols plus written comments. Preliminary examination of the report forms suggested there were many ways in which the children were exhibiting awareness of and relationship to the environment.

GENERAL CONCLUSIONS

1. The children related to objects.
2. The children did not relate to their peers.
3. The children were unable to accept changes in routine.
4. The children showed affection with the three adults but were otherwise unwilling to allow physical contact.
5. The three activities in which the children most successfully engaged were looking at pictures, listening to music, and doing puzzles.
6. The children were more successful in writing or printing the letters than in reading or naming them.
7. The children did not engage in teamwork in either the schoolroom or playroom.
8. Some autistic children produce self-imitated sounds and words, rather than imitating an adult.

SUMMARY

This pilot study attempted objective description of certain aspects of autistic children's speech production, language comprehension, and relationship to the environment. For each of the three areas, it was determined that data could be quantified in tabular form to indicate trends in the behavior of these children. Comparison of results in the three areas revealed discrepancies in the data which are no doubt due to the crudeness of the preliminary rating scales. It is obvious that measurement and observational techniques will need considerable refinement before further data are obtained. However, the pilot study did produce sufficiently promising results to encourage detailed study of the language development and comprehension of autistic children combined with an analysis of other aspects of their behavior.

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CURRENT TREATMENT METHODS AND POTENTIALS OF ONGOING RESEARCH IN THE FIELD OF MUSCULAR DYSTROPHY

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TODAY, we lack knowledge of many basic processes concerning the function and composition of muscle on the molecular level. Because of this lack of knowledge about normal muscle, it is not astonishing that we have failed to reveal the cause of some muscular diseases. Progressive muscular dystrophy (P.M.D.) is one of the many unsolved riddles in the field of neurology. For the patient suffering from this disease, as well as for his relatives and the medical people involved in the patient's care, the only hope is research.

I should like to begin my description of the disease by discussing some current aspects of its classification. We have to base our classification on clinical and genetic features. A correct classification of a given case of P.M.D. is of more than theoretical importance. Such classification is necessary in order to evaluate the prognosis and to answer questions connected with genetic counseling. In a paper published in 1959, two Americans, Chung and Morton[6] reported an investigation in which modern methods of genetic analysis were used in an effort to find a reliable basis for the classification of P.M.D. In their study they analyzed not only their own material but also pedigrees presented in earlier literature. Some 800 patients were thus analyzed. After using 18 different clinical and genetic characteristics as discriminating factors, they claimed that the genetic ones are the most reliable for differentiating between different types of P.M.D. Chung and Morton proposed a classification consisting of 3 groups. This classification was introduced by Walton and Nattrass[17] in their paper of 1954.

The first type is the pseudohypertrophic or the Duchenne type. It is inherited according to a sex-linked recessive trait. The affected sex is the male, the defective gene being transmitted through the female. The onset occurs between 1 and 5 years of age. The pelvic girdle is first affected and spread to the shoulder girdle occurs within 3 to 5 years. Pseudohypertrophy and muscular contractures are common. The course is steadily and often rapidly downhill, with inability to walk occurring within 10 years after onset.

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The facioscapulohumeral form comprises the second group. It is inherited as an autosomal dominant, i.e., one of the parents is affected and transmits the disease to half of the children, sons and daughters equally. The onset is usually in adolescence. The facial and the scapulohumeral muscles are first involved; spread to the pelvic girdle muscles occurs within 20 to 30 years. Pseudohypertrophy is extremely rare and muscular contractures are uncommon. The progression is slow and the life span may be normal.

The third group, from the clinical point of view, is more heterogenous and is named the "limb girdle" type. The mode of inheritance is autosomal recessive, i.e., both parents are healthy carriers of the abnormal gene and about a fourth of the siblings of the patient will have the disease. Negative family history can be expected in a great percentage; Chung and Morton found positive family history in 59 per cent. The onset is often in childhood but may occur later. The muscles first involved can be those in either the pelvic girdle or the shoulder girdle; spread from the initially affected muscles to other muscle groups occurs within 20 years. The prognosis varies but in general it takes between 20 and 30 years before complete disability ensues.

A fourth type was described by Becker,[1] who in 1955 reported upon a family in which P.M.D. was inherited as a sex-linked recessive. Clinically, it resembled the Duchenne type, but was late in onset and very slow in progression. In 1951 Lisa Welander[18] described a distal form inherited as an autosomal dominant with incomplete penetrance. This disease starts at 40 to 60 years of age and follows a benign course. The rare form which starts in the ocular muscles should also be mentioned in this context.

The myotonic type is the most common form of dystrophy with onset in adulthood. Besides dystrophic changes in the muscles, many other features such as myotonia, gonadal atrophy, cataract, and baldness characterize this type. It is transmitted by a dominant gene and is generally looked upon as a specific disease distinguished from other forms of P.M.D. In the following, we will not be concerned with the myotonic forms.

In a brief presentation, it is impossible to give a complete picture of all biochemical and structural findings in P.M.D. An enumeration of known facts would not serve any useful purpose so long as the many pieces of information cannot be put together into a satisfactory and clarifying pattern. The literature covering biochemical findings up to 1958 is carefully reviewed by G. A. Buscaino[5] in *Acta Neurologica Napoli*, 1959. I will restrict myself to some remarks on histopathological and ultrastructural changes and on some biochemical changes of diagnostic interest. At the end I would like also to discuss some general aspects of research relative to the field of P.M.D.

If we look at the microscopic picture of a cross-section of moderately affected muscle, we find normal-sized, hypertrophic, and atrophic fibers intermingled. The hypertrophic fibers appear early in the course of the disease. The nuclei in these fibers often have a central position. An essential pathologic feature is the ingrowing of connective tissue and capillaries, the result of which is that the fiber later is split longitudinally into smaller fibers. It is possible that the

atrophic fibers represent split fragments. As the disease proceeds, more and more fibers are destroyed and there is an increase of connective tissue. Especially in pseudohypertrophic muscles is the abundance of fat tissue conspicuous. Signs indicating regeneration of muscle fibers are not common but do occur.[19] We[9] have recently studied secondary changes of the intramuscular nerves which can occasionally be found. When a muscle is partially denervated, collateral sprouting of new axons occurs from the intact residual axons. This sprouting from terminal and preterminal motor nerve fibers can also be seen in a pure myopathy such as P.M.D. We have also observed how terminal nerve fibers end in immature end plates on muscle fragments, suggesting the possibility that the fragment of muscle fibers formed by splitting may become innervated.

Some studies of the ultrastructural changes in dystrophic muscle have recently been undertaken. We need, however, more knowledge about the normal ultrastructure and the structural changes induced by denervation before we will be able to interpret those findings in dystrophic muscle which I am about to describe. Changes of the following constituents have been reported: (1) the myofilaments, which are the ultimate contractile elements of the muscle fibers; (2) the mitochondria, in which an important part of the energy metabolism occurs; (3) the sarcoplasmic reticulum; and (4) the Golgi complex. The functions of the two structures last mentioned are not quite clear. It has been suggested[2,14] that one function of the sarcoplasmic reticulum should be transmission of the action potentials to the interior of the fiber. V. L. van Breemen[4] observed vacuolation of the sarcoplasmic reticulum and enlargement of the Golgi vesicles as early changes in human dystrophic muscle. Dr. van Breemen[3] has also described decreased size and an increased density of the mitochondria. Ross, Pappas, and Harman[15] compared muscles from normal and dystrophic mice and reported as the most salient findings in the dystrophic muscle, fragmentation and dissolution of myofilaments resulting in a gradual disappearance of myofibrils. In contradiction to van Breemen's findings in human muscle, Ross and his co-workers found the mitochondria to be increased in size. The latter authors also found that in a muscle cell with a central chain of nuclei, the loss of myofibrils was confined to the central region.

In many fields of medicine, determination of the activity of different enzymes is of practical importance for both diagnosis and differential diagnosis. Some of the enzymes which now can be determined in an ordinary hospital laboratory have some interest for P.M.D.[11] As for the transaminases, two are of current clinical importance, namely, serum glutamic-oxaloacetic transaminase and serum glutamic-pyruvic transaminase. For convenience, the first one is called SGO-T and the second one referred to as SGP-T. In general it can be said that the SGO-T level is increased in a myopathy in contrast to a neuropathy where one finds normal values. The values are most markedly and constantly elevated in the Duchenne type of P.M.D.[11,12] Aldolase is an important glycolytic enzyme, following the same pattern in myopathy as SGO-T. Dreyfus and collaborators found increased aldolase activity in serum but decreased activity in muscle of patients suffering from P.M.D.[7] In half of their P.M.D. patients they also found aldolase activity to be higher in venous than in arterial blood. They concluded that the

increased aldolase activity in serum is dependent on a leakage from affected muscles.[8] Lactic dehydrogenase is moderately increased in muscular dystrophy. The above-mentioned biochemical findings are, as you know, not specific for P.M.D. They can, however, be used as diagnostic tools for differentiating between a myopathy and a neuropathy and to contribute to the pool of tests for evaluation of treatment.

No treatment is known today which provides a correction to normalcy or an arrest of progression. Physical therapy and other supporting methods are of great importance in keeping the patient ambulatory as long as possible, to prevent or postpone contractures, and to keep unaffected or mildly affected muscles in good condition. It is well established that the disability becomes worse if the patient, for one reason or another, has to be confined to bed, even if it is for only a short time. It is wise to keep in mind that cardiac muscle is affected in a great many patients. Overweight should be avoided in order to lessen the burden on both the cardiovascular and the locomotor systems. In one of Milhorat's[13] many papers on problems concerning P.M.D., he deals with therapy. In a table, he lists 82 substances and procedures which have been used in the treatment of P.M.D., none of which had had any significant lasting effect. Dr. Milhorat's paper appeared in 1954 and, since then, more substances and procedures have been tried. The treatment of choice, however, still remains to be found.

CONCLUSION

How can the riddle of progressive muscular dystrophy be solved? First, we need more knowledge about normal muscle. This knowledge is increasing rapidly. In 1955 for example, about 1,000 papers on muscle were published. We also can hope to get valuable information from the study of nonhereditary muscular diseases. Such a study can be expected to shed light on both normal and pathologic processes in muscle. Many different endocrinologic and metabolic disorders affect muscle. This subject has recently been reviewed by Shy.[16] In this context, I should like to mention that it has been shown that structural muscle proteins such as myosin, actin, and tropomyosin have autoantigenic properties.[10] It has also been observed that macrophages surrounding an injured muscle fiber can contain myosin which can thus reach the reticuloendothelial system.[12] The possibility that autoimmunization plays a part in muscular diseases deserves investigation. Further research on experimental muscular disease in laboratory animals is welcomed. The interest in this context, especially, has centered on studies of dystrophy in mice. A mouse strain bred at R. B. Jackson Memorial Laboratory, Bar Harbor, Maine, has a dystrophic muscular disease transmitted as an autosomal recessive gene, with many features similar to those of human muscular dystrophy.

I will now close by expressing the hope that the colleague who receives the honor of speaking about progressive muscular dystrophy at the next world congress will have the pleasure of bringing more encouraging answers to the questions about etiology and treatment than I have been able to do today.

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CLEFT LIP AND CLEFT PALATE: CLINICAL MANAGEMENT AND REHABILITATION

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CLEFT LIP DEFORMITY

THE repair of cleft lip deformities, either unilateral or bilateral, has been revolutionized in the past eleven or twelve years, particularly by such men as LeMesurier,[1] Steffenson,[2] Tennison,[3] and Cardoso.[4] Many variations of their techniques have followed but the principles have remained the same, and have, moreover, contributed to a greater effort on the part of many plastic surgeons to perfect the repair of this deformity. In 1953 we added a new concept to the treatment of cleft lip deformity by describing a skin prominence running approximately 1 mm. above and parallel to the mucocutaneous junction which we called the "mucocutaneous ridge." This is evident not only in a normal lip but in all cleft lip deformities, both unilateral and bilateral, and should be the main index in the reconstruction of lip deformities. We realized at the time that the Cupid's bow is well formed in the unilateral cleft lip deformity, and we shudder to think that during past years this Cupid's bow was sacrificed in whole or in part in the initial lip repair. It seemed logical to us that any operation that preserves what appears to be a normal Cupid's bow formation should receive utmost consideration, so we adopted, with some modification, the technique described by Tennison. We feel that our accomplishment in the field of lip repair has been mainly due to the recognition of this mucocutaneous ridge and the utilization of it as the all-important index of lip repair.

The technical description of a method of repair would be of no interest to a group of this type; suffice it to say that all our markings for the repair of a cleft lip deformity originate from the termination of the mucocutaneous ridge. The Cupid's bow is therefore added to the over-all transverse length of the repaired lip with the ultimate better eversion and more normal contour.

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We adopted the same principle in bilateral cleft lip repair because we observed that not only the lateral elements of the lip but also the prolabium showed evidence of a distinct mucocutaneous ridge. We found that if we utilized this mucocutaneous ridge as a definite index in the repair of the lip, we could produce a full upper everted lip and avoid a tight lip which is so evident following other methods of repair.

Together with this, we did experimental studies on the prolabium and determined that the prolabium contained all the elements of the lip, even though underdeveloped, and was therefore definitely a part of the lip. We had other evidence that in adult life the prolabium definitely grows hair and this was another proof that the prolabium belonged in the lip and should be utilized in its entirety in the over-all repair of the lip. In the past the prolabium has been treated with so much disrespect that all we can hope to do is stress the importance of preservation of the prolabium and hope that the scarred prolabium will eventually be a thing of the past.

The repair of both unilateral and bilateral cleft lip deformities is performed as soon as the child has passed birth weight and is in good enough condition to withstand a procedure of this type. In a complete unilateral cleft of the lip, an attempt is made to close the anterior palate in conjunction with the lip repair since this is a unique opportunity. After the arch collapse it is difficult to gain entrance to this region. In bilateral cleft lip repair we follow the same principles. In a complete bilateral lip and palate repair we attempt to restore the anterior palate and the lip on the same side in one procedure. The anterior palate of the lip on the other side is closed at a second operation, approximately six weeks to three months later.

CLEFT PALATE REPAIR

A cleft palate can simply be described as "a hole in the roof of the mouth." This "hole" may include both the hard and the soft palate in their entirety or just in part. There are generally two methods of closure of this palatal defect; by operation and by insertion of a prosthesis. We feel that cleft palate patients should have the benefit of surgical closure. There has been sufficient evidence presented both subjectively and objectively in the past that good restoration of the palate has been accomplished very satisfactorily by good surgery. There are, however, some stumbling blocks, such as insufficient material adjacent to the cleft and a patient who is a poor surgical risk, or who is elderly. Restoration of the palate in these cases can be accomplished by prosthesis. We predict that some day there will appear a definite program for determining whether many of the patients we are now operating upon should have restoration of the palate by prosthesis instead. As of now, this information is not clear-cut, and the decision depends entirely upon clinical impressions. With the results we are getting, we will continue in our efforts to restore the palatal defects by operation when possible.

The methods of repair of palatal defects are so various and so numerous that we would not like to go into detail regarding the technical aspects. In our Clinic

palatal defects are repaired exactly as described by Professor T. Pomfret Kilner, Nuffield Professor of Plastic Surgery, Oxford University, England, who has contributed so much to the welfare of cleft palate patients and whose technique has served our purpose well. Years ago we performed palatal operations at approximately the end of the first year of life, but because of some possibility of interference with the growth of the maxilla, we decided to hold off a bit longer for the repair of the palate. Operations on incomplete or partial cleft of the palate are now performed on patients approximately 18 months to 2 years of age. Operations for complete clefts of the palate are sometimes delayed for as much as 2 or 3 years. This is a variable figure and all cases are judged clinically. We do not believe that the time factor is as important as the type of operation employed. We have seen evidence throughout the years to indicate that inadequate surgery has produced irreparable damage to the maxilla and its related substance, creating a great problem for the complete rehabilitation of the cleft palate patient. Our association with both the Lancaster Cleft Palate Clinic and our own Allentown Cleft Palate Clinic has given us a wonderful opportunity to observe patients operated upon with recognized procedures, frequently in multiple stages. Sometimes the palate is distorted beyond repair. Our respect grows more and more for our colleagues in speech and dentistry who have accomplished so much in reparative work. We feel that by the utilization of this method of repair we are not doing much harm and are not producing the severe distortion and surgical failures previously described in the literature. Following repair, the patient as a rule has little more discomfort than following tonsillectomy. It is sometimes difficult to get the patients to take fluid, especially the younger ones, but usually after the second or third day they react very favorably to their condition and take fluids readily. The hospital stay is usually 7 to 9 days, and no aftercare is necessary. Table feedings are permitted usually after the fourteenth to the sixteenth day. As a rule, only one operation is necessary, but at times some small opening occurs, especially in the very front of the palate; this may be closed in a secondary operation. At times there is not sufficient material for closure of some of these small openings in the front of the palate and a plate must be inserted. This is not objectionable, however, since many cases require tooth replacements in the same location and the prosthesis thus serves a double purpose.

REHABILITATION

Restoration of the palate is not sufficient to rehabilitate the cleft palate patient completely. We are definitely not in accord with the surgeon who dogmatically states that he can handle the entire situation by himself. This is not giving the unfortunate patient the opportunity he so rightfully deserves. The greatest advancement in cleft palate rehabilitation was the development of groups, including plastic surgeons, dentists, orthodontists, prosthodontists, psychologists, speech therapists, pediatricians, otolaryngologists, and many others. Without them we fail in our efforts. None of us has the correct answer to all the problems. There are patients with a short palate, a perforated palate, or an open cleft who have good speech. And the reverse may be true.

Speech is an important phase in the rehabilitation of the cleft palate patient. It deserves utmost consideration. What is the standard index for evaluation? There are entirely too many men evaluating speech results without scientific basis and without the help of a qualified speech therapist. This attitude many prove detrimental to our progress and will make a fair survey extremely difficult. We must accept the judgment of a qualified therapist, both as a speech trainer and a person who can evaluate speech results. It might also be interesting, however, to have a parallel survey made in a group consisting of employers, lawyers, students, etc., and to get their reactions since, after all, their opinions are of extreme importance in the social life of the rehabilitated cleft palate patient.

A crippled child has been defined by the International Society for the Rehabilitation of the Disabled as an individual "whose activities have become so far restricted by loss, defect or deformity of bones and muscles as to reduce his or her normal capacity for education and self-support." In terms of this definition, an individual with a cleft palate or a cleft lip is a cripple and deserves consideration in our rehabilitation program. It is not sufficient to give him a lip and a mouth that are almost natural; it is much more important to give him speech that is clear and distinct. As citizens, we have the responsibility of helping to determine available community agencies which could place this individual under proper care and guidance. As teachers, we must give these children every opportunity to enter into classroom activities. They should have special participation in some speech situation every day. Efforts should be made to develop special interest and ability. If the teacher approaches the problem tactfully, there will be no embarrassment either on the part of the cleft palate pupil or of his classmates. Situations should be discussed with the parents by their attending physician. A consultation with a plastic surgeon with training in this particular field should be sought. He in turn will seek help from other personnel especially trained in this specialty. They may detect that the child may be normal in every other phase except for the fact that Nature has denied him some of the substance used in the production of speech, chewing, and normal appearance.

This child may be expected to differ from other children just as members of a family differ one from the other. The child may be shy and withdrawn because of his defect and thus need encouragement to join in social experiences without too much parental protection. On the other hand, a child may assume the opposite attitude because he is in need of social acceptance. This also requires help and understanding. It may be well to encourage him to develop special ability in fields where he shows interest or talent.

We wish especially to take this opportunity to pay tribute to Dr. Herbert Cooper and his staff at the Lancaster Cleft Palate Clinic for their pioneering in this field, to Dr. Robert H. Ivy, Chief of the Cleft Palate Section, Department of Health, Harrisburg, Pennsylvania, for his efforts in organizing various clinics throughout the State and his ever-ready help and encouragement, and to our associates, medical, dental, and speech, in the Allentown Cleft Palate Clinic who have contributed so much to this presentation and to the welfare of the cleft lip and cleft palate patient.

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COUNSELING PARENTS OF CHILDREN WITH CLEFT LIPS AND PALATES

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THE MATERIAL presented here is based on an exploratory study, now in its fifth year, which has been supported by a grant from the National Institute of Mental Health. The purpose of the study is to describe and investigate factors related to the adjustment of individuals with cleft lips and palates.

The hypotheses being tested are the following:

1. Factors other than the anatomic deviations differentiate the child with a cleft palate from other children.

2. The nature and severity of the adjustment problems of individuals with cleft lips and palates are determined in part by (a) the adequacy of the information their parents have, (b) the nature of the adjustment of their parents, and (c) the attitudes and behavior of their parents, particularly with reference to the cleft and associated problems.

The main part of the study is built around a coded interview. The questions asked during the interview covered the areas of birth history, physical development, medical history, speech history, and school history of the child; family health history; discipline practices; marital relationships; social home environment; and occupational history. In the event that the child had an educationally significant hearing loss, questions were also included dealing with the hearing problems encountered by the child.

The interview technique used in this study was patterned after that used by Kinsey in his studies of human sex behavior. This technique involves the coding of the possible responses to the interview questions in such a way that a history may be taken by recording numbers only.

Some people may register dismay when they hear that the taking of case histories has been reduced to recording numbers. If one is going to deal with a large number of case histories of the traditional type, however, he must inevitably

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count and classify items from the histories and then abstract from these items such general statements as can be made about the group as a whole. In using the technique under consideration here, an attempt is made to group and classify the possible answers before the interviewing is done. Such groupings, of course, are made only after an extensive review of the relevant literature, clinical experience dealing with the problem under investigation, and trial interviews.

In this instance an interview was finally designed which included approximately 715 questions for the mothers. These interviews took an average of 3½ hours. The fathers were seen at the same time by a different interviewer and were asked approximately 450 questions. These interviews averaged from 2 to 2½ hours. Finally 86 questions were asked of the children who were over 10 years of age. The study has involved approximately 2,000 clock hours of interviewing.

To provide context for the interview data, other evaluations were also made. These included appraisals of the adjustment and intellectual capacity of the parents; appraisal of the intellectual capacity and social development of the child; and physical, dental, audiologic, speech, and radiographic evaluations of the child. The evaluations were performed by appropriate professional personnel.

The experimental group families included 175 sets of parents of children with cleft lips and palates. The children ranged in age from newborn infants through those 15 years of age. One hundred and fifty sets of the experimental group families came from Iowa, the rest from five other midwestern states, primarily Illinois. One hundred and thirty-five sets of families had received at least some of their care at the University of Iowa Hospitals.

The study also included 175 sets of matched control group families. Family-by-family matching involved the age of the child, the family size, and the rural-urban background of the family. Matching within four age groups (newborn to 17 months; 18 months to 5 years 11 months; 6 years to 13 years 11 months; and 14 years to 15 years 11 months) included the sex of the child, the socio-economic status of the family, and the religious affiliations of the family. Finally, controls were exercised, in so far as possible, on the birth order of the child, the religious affiliations of the families within the Protestant groups, the occupations of the fathers, and age within age groups.

Analyses of the data obtained from the study are in process. The comments which follow are based on a preliminary analysis of the data and are subject to revision after the analyses have been completed.

However, before we examine the data let us consider some of the reasons why the members of the professional team should be concerned with the problems of a psychosocial nature which surround the presence of a cleft. First, let us consider one of the paramount objectives in the habilitation of an individual with a cleft—the improvement of his ability to communicate in order to facilitate his vocational and social effectiveness. To accomplish this objective it is quite obviously not enough to be concerned only with establishing the physical continuity of the structures and providing drills on certain speech sounds. Effective communication requires a speaker who sees purpose and finds satisfaction in social interaction. It also requires a person with a minimal sense of social worth. Without these attitudes it is quite possible that an individual who has been provided

with the most expert medical, dental, and speech care may be unable to profit from the help he has been given, a gross waste of highly skilled and costly services.

Second, we must remember that our culture plays an important part in determining how we feel about a given state of affairs. Unless we are mentally ill, each of us conforms to a greater or less degree to the practices and customs of our environment. In our culture social distinction is based, in part, on physical attractiveness. Therefore, we generally view facial deformities as a handicap. Anyone who looks different is set apart from the group. Since he looks different, it is often assumed that he is different in ways which have no direct relation to his deformity. Frequently the person involved becomes as convinced of the existence of his assumed differences as those about him. And so the deformity may come to have a symbolic value which has far greater significance than the problems created by the defect itself.

Third, parents of children with physical deformities frequently experience feelings of anxiety and guilt because of the child's condition. These feelings are partly due to the fact that the parents do not understand the etiology of the deformity. Since they are dealing with the unknown, they tend to develop feelings of anxiety and guilt when they are faced with the questions of friends and relatives concerning the nature and cause of the defect. They are aware of the fact that the great majority of newborn infants do not have deformities. It is only natural that they ask themselves, "Why did this happen to us?" or "What have we done to deserve this?"

Inevitably, the parents arrive at answers to these questions. The answers sometimes involve themselves, sometimes others, and sometimes the supernatural. Feelings of guilt are especially likely to develop in these situations if the parents have any apprehensions about past behavior. The wife is also likely to feel guilty because, in our culture, she tends to accept the greater share of responsibility for bearing a deformed child, a point of view with which the husband often agrees.

Finally, it should be observed that the great majority of parents look forward to having a "perfect baby." Yet the parents of a child with a deformity seem to behave as though it is socially and perhaps morally unacceptable to admit that they once shared in this universal dream.

So far nothing has been said specifically about attitudes toward individuals with clefts. The omission has been deliberate to make the point that many of the feelings that people have about clefts are not unique to them but rather are characteristic of the cultural attitudes about deformities in general. These comments have also been made to point out the bases for many of the built-in conflicts which would face most of us as parents in dealing with a child with a physical deformity.

Now let us examine some of the data obtained by interviewing the parents of children with clefts. Some implications for counseling can be obtained by considering the reported concerns of these parents upon the birth of the child with the cleft. Table I summarizes the responses from the parents when they were asked, "What were you mainly concerned about when you first learned of the cleft?" One may question whether or not the parents really reported their first main concern since these were retrospective reports. However, on the basis of

other data and the interview impressions, the responses to this question seem to have good face validity. In any event the parents' answers to the question reflect their feelings at the time of the interview and, as such, provide provocative material for counseling. The categories listed in Table I are arranged in the order of frequency of being reported. It is to be recognized that many of the categories are not mutually exclusive, and it must be emphasized that the categorizations presented here are subject to revision.

TABLE I. SOME OF THE MOST COMMON MAIN CONCERNS REPORTED BY PARENTS ON LEARNING THAT THEIR CHILD HAD A CLEFT

CHILDREN WITH CLEFT LIPS AND PALATES		CHILDREN WITH CLEFT PALATES ONLY	
MOTHERS	FATHERS	MOTHERS	FATHERS
*1) "What to do"	*1) "What to do"	*1) Survival	*1) Survival
*2) Appearance of child	*2) Repair	*2) Speech	*2) Not concerned
3) Pity for child	*3) Concern for wife	*3) Curiosity	3) Repair
*4) Self pity	*4) Survival	4) Other health problems	*4) Speech
*5) Repair	5) Shock	*5) Self pity	*5) Curiosity
*6) Survival	6) Future problems	6) Importance to child	*6) Shock
7) Role of self in etiology	*7) Appearance of child	*7) Not concerned	7) Heredity
*8) Concern for husband	8) Repugnance toward anomaly	8) General care	8) Concern for wife
9) Speech	*9) Self pity	*9) Shock	*9) Self pity

*Concerns common to reports of both parents.

First, let us consider the concerns of the parents of children with both cleft lips and palates. In general the mothers appeared to be concerned for the health and appearance of the child. The fathers, on the other hand, more commonly reflected a desire for specific plans for physical care. The fathers' relatively high concern for the mothers' reaction to the cleft would seem to provide support for the notion that in our culture the wife bears greater responsibility for the birth of a child with a cleft. The fathers' concern for their wives' reactions may also be high in part because the father frequently was asked to tell his wife that the child had a cleft even though he typically knew very little about the implications of the cleft for the child or for the family.

The responses of the parents of the children with cleft palates only suggest, in general, that these types of clefts are less disturbing to parents. Survival is undoubtedly a high item here because there is no facial defect and, consequently, no cosmetic problem. Thus there is no immediate concern about surgical repair. Rather, feeding is the most crucial problem with this group at this time.

It should be noted that "Not concerned" appears in the columns of both the mothers and the fathers of the "palate only" group. This item suggests that the problems of individuals with a cleft of the palate only are frequently played

down in counseling if, in fact, they have received any. Such a policy would seem to be inadvisable, at least in so far as speech is concerned. Convincing data exist which show that individuals with cleft palate only have a poorer prognosis for adequate speech that do individuals with clefts of the lip and palate. It would appear from these findings that a number of the parents involved are frequently poorly prepared for such consequences.

Many more descriptive statements could be made about the parents of children with clefts and about the children themselves. However, because of space limitations let us consider some of the counseling needs which are revealed in these data.

First, let us consider the counseling needs during the first day after the delivery of the infant with a cleft. During this period the parents are in a state of shock. As one of the fathers described the period:

> "It was a shock to everybody, I guess. The doctor was even surprised, I guess. The first case he'd ever seen like that. Well, I tell you, he called me into the room and he didn't even tell me there was anything wrong. After she was born and before they even had cleaned her up or dressed up or anything. It was a surprise to me and he kept saying he was sorry. It was his first case like that. He just said there wasn't any hope for her as far as he could see."

This is not a time for detailed counseling. This is, however, a crucial time for establishing attitudes toward the child. It should be stressed that in a very real and perhaps crucial sense the obstetricians, nurses, ward attendants, and other members of the hospital staff are members of the cleft palate team at this particular time. It should be remembered that the parents of the newborn with a cleft typically have had no intimate experience with a person with a cleft. They are starting from scratch, as it were, with this child. Because they have tremendous respect for medical doctors and nurses, they naturally look to them for support. Perhaps more significantly, the parents take their cues from these people with respect to the attitudes to be held toward the child. The people around the parents at this time may show a gossipy, morbid curiosity or they may exhibit largely nonverbal behavior which reflects understanding and warmth. It is obvious that the parents will respond differentially to their child, at least in part, as a consequence of the climate that surrounds them at this time.

It has just been stated that the first few hours after the delivery do not appear to be an appropriate time for detailed counseling. However, this is the time for putting the problems in perspective. If the child has no other anomalies in addition to the cleft, as will be the case in approximately 75 per cent of the cases, many positive statements can be made about the child. Parents need to be assured that this is not an emergency problem and that no habilitation procedures will be instituted until the child has regained his birth weight and has "gotten a good start in life." The parents should also be told that there are professional people who specialize in the habilitation of individuals with clefts and that in due time arrangements will be made for appropriate referrals.

Finally, the parents need to be assured that the presence of the cleft is not the result of something which they may have done or feelings they may have had. However, care must be taken to insure that the parents do not construe this particular counsel to mean that heredity is not a possible etiologic factor. In our experience parents frequently appear to be anxious to rule out heredity as an etiologic basis for the cleft.

So far we have been discussing some of the counseling needs during the first few hours after the delivery. Let us now turn to a discussion of the counseling needs of the parents following the initial period of shock but prior to departure from the hospital. The parents need to be told of the availability of resources and facilities for caring for the child with a cleft. They need to understand that there are specialists to do this work and the specialists need to be briefly identified and their roles described. As a consequence of this discussion the parents should be left with a generally positive feeling concerning the chances for a successful habilitation program. In this connection, it would seem wise to show the parents of children with cleft lips some pictures of other children with similar clefts before and after surgery. It must be remembered that most of these parents have never seen cleft lip prior to operation. Many of them may feel that there is little likelihood that their child's cleft can be satisfactorily repaired. Even "before and after" pictures which show less than superior cosmetic results will frequently provide the reassurance which the parents are looking for.

Parents should be given some instructions at this time concerning the feeding of the child. As far as possible the instructions should be kept simple and should involve normal feeding procedures. Parents frequently reveal that they feel uncomfortable when required to use unusual and conspicuous feeding procedures in public. The instructions should also include explanations concerning the best position for feeding the child, why food and liquid may come back through the nose during feeding, and ways to handle choking.

During this period the parents should be encouraged to take an active part in the care of the child. They should be given an opportunity to examine the cleft, and to hold and feed the child. In any event appropriate planning should be instituted to insure that the first intimate contact between the parents and the child occurs considerably in advance of the time when the mother and baby are released from the hospital.

When the parents take the baby home from the hospital, they should have received enough information and support to have developed a positive feeling toward the child and to be able to deal adequately with the many manifestations of the attitudes of our society toward individuals with deformities. They need to have some basis for answering the questions of relatives and friends concerning the child and to be prepared for the realization that many of the problems which their child will face are not directly attributable to the presence of the cleft.

Now let us consider some of the other counseling needs that should be met some time during the period of habilitation. A specific time when these needs should be met is not given because such scheduling is a highly individualized matter to be determined in the light of the needs of the individual family and in terms of the particular habilitation center program.

Some time during the period of habilitation the parents need to be given a description of the usual program of management which includes a typical calendar concerning the times for the various physical procedures, length of therapy, costs of care, etc. Frequently families have the feeling that all will be well as soon as the cleft is repaired. This feeling is sometimes abetted by the individuals who provide the physical management. Such a notion is dangerous oversimplification of the facts and should be avoided.

To the extent of their capabilities, the parents need to have some appreciation for the importance of environmental and psychologic factors. Without any appreciation of these factors, they may frequently be ill prepared for the absence of satisfactory behavioral results following obviously satisfactory or even superior physical results. They need to understand that, in a very real sense, they are members of the habilitation team since the nature of their relationships to their child may play a major part in determining the success of the habilitation program.

Parents are frequently confused by the variety of professional workers involved in the team approach and in the roles played by each of the workers. Someone must take the time to describe the members of the team to the parents, thus providing them with some appreciation for the magnitude of the habilitation program and the desirability of pooling the professional skills of the team.

The parents should be given a brief description of the ways that speech sounds are produced and of the roles played by the various articulators in producing these sounds. Certainly they need to understand the basis for the close relationship which exists between palatal functioning and speech production. If they have such an understanding, they will be prepared, at least to some degree, for the possible recommendations for physical management designed to improve velopharyngeal closure.

Parents need to have some information concerning the etiology of clefts. As was indicated earlier, parents tend to avoid explanations which include heredity. It is interesting to note that 84 per cent of the parents in this study whose families had a history of clefts rejected the notion that the previous history had anything to do with the cleft of their child. This comment is not made with the intent to account for all clefts on a hereditary basis. In fact, most authorities today accept the notion of multiple causation as the most adequate explanation of cleft etiology. In any event, the state of our knowledge at this time does not allow us to identify the etiologic basis for the presence of a cleft in any given instance. However, it is felt that the question of etiology should be discussed with the parents even though it cannot be answered definitively. The parents seem to find such discussions satisfying, and a good preparation, at least to some degree, for the inevitable questions concerning etiology which they and their child will face. The very fact that the "experts" do not fully understand the etiology of clefts seems to be reassuring to them and provides them with a basis for giving an "I don't know" answer when they are asked what caused the cleft.

The parents need to be given what psychologists call "anticipatory guidance" in dealing with several problems. These problems include (a) the child's questions about himself and his cleft, (b) limitations that may be imposed on his activities

particularly with reference to highly verbal activities, (c) acceptance by peer groups, especially during adolescence, and (d) marriage. The last item in this list is one which is apt to generate some highly charged emotional responses. For example, surprisingly few parents say that they expect their daughters with clefts to marry. Frequently parents are visibly upset when questioned about the possibility that the child's children may have clefts. However, these are real issues and failure to face them squarely will likely result in more serious problems later on.

The parents need to be helped to view the child's potential realistically. Many of the parents hope that their "handicapped" children will become professional persons, especially medical doctors and nurses. Yet many times these goals are most unrealistic and indicate a definite need for vocational guidance. As one mother expressed the point:

> "I feel that it's just such a pity those children do come into the world that way. And you know, they're usually the brightest youngsters we have. I mean they're compensated for that particular deformity by an alert brain."

Finally, let us look briefly at some of the attitudinal differences between the experimental and control group families in this study. In one sense we can view the control group families as representative of what the experimental families were like prior to the birth of the child with the cleft. From this point of view, the control group families provide us with a "base line" of attitudes concerning clefts with which the experimental families start. The control group families showed little understanding concerning the nature of clefts and the management procedures typically employed. For example, only about 1 per cent of the control group families had seen an unoperated cleft. Although some of them did report that they had seen such clefts, further questioning revealed that they were usually describing the scar resulting from the repair. Many of the control group families felt that the poor speech which youngsters with clefts frequently exhibit was due to the cleft of the lip. They had no conception, as a rule, of the role of the palate in speech production. Many of the control families seemed to be less defensive about themselves and their children. They tended to report, for example, higher incidences of whining, teasing, and hitting for their children than did the experimental families. However, they considered this behavior to be "average." The control families also seemed to be less concerned about their children's impact on others. Their goals for their children were less well formulated. In general, the differences tended to confirm the importance and effects of our cultural attitudes toward the family with a physically handicapped child.

In summary, the counseling of the parents of a child with a cleft should be done with an awareness of the following points:

1. *A unified team approach.* We make the parents the real "experts" if we require them to choose between conflicting points of view on the part of the members of the team.

2. *Constant, repeated interpretation of what is going on.* We must not expect that any single counseling session will meet the needs of these families. Rather, the administrative framework of our program should recognize the need for continuous counseling and should provide a structure such that some member of the team has the time to follow through.
3. *Positive, yet honest, evaluations of the problems by all specialists.* When one mother asked if her child would have normal speech following palatal repair, she was told: "She will if she has any gray matter." Such counsel is obviously extremely unwise since it is frequently irrelevant and lacking in constructive consequences. Furthermore, as the irrelevance of the advice becomes clear to the parents, a negative, destructive relationship may easily develop between the parents and the members of the professional team.
4. *Recognition of the parents' role and needs in the habilitation program.* Parents should be brought into the management program and should be made to feel free to express themselves and to ask questions. Many of the feelings of guilt, defensiveness, and resentment that exist can be minimized if not eliminated entirely, if effective communication exists between the parents and the professional team.

PROBLEMS OF LARYNGECTOMEES

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THE SUBJECT matter of this section of the international meeting of persons interested in the physically handicapped is unique. We are witnessing the introduction to this assembly of another type of physical handicap—that resulting from surgical removal of the larynx. Its consideration here attests the fact that the number of "laryngectomized" persons is now large enough to gain the attention of rehabilitation officials throughout the world.

An increasing number of patients survive surgical removal of the larynx because of the important contributions of research, improved surgical techniques, use of antibiotics, improved postoperative nursing, and public education. Public education has been promoted by organizations such as the American Cancer Society to the end that more and more persons are consulting their physicians at the first signs of hoarseness or throat distress. Physicians, being more alert to these symptoms, are discovering cancer of the larynx in its early stages. Early removal of the cancerous growth gives greater assurance of survival, and indeed permits large numbers of persons to resume normal lives.

Although the person whose larynx has been removed appreciates the capable services that contribute to his survival, he experiences emotional trauma when he realizes that he cannot talk. This situation, which now occurs 2,000 to 3,000 times yearly in the United States, demands the immediate cooperative effort of the surgeon, nursing staff, social worker, and the speech pathologist to restore the patient to society. The patients, however, have not stood idly by, waiting to be rehabilitated. They have followed the paths of many other handicapped persons who resolved to merge their assets to help each other by forming associations or clubs. The earliest known mutual club for laryngectomees was formed in 1932 here in New York City under the guidance of surgeons from the Presbyterian Hospital. The real impetus to the philosophy of helping each other was given by the formation of the International Association of Laryngectomees in Cleveland, Ohio, in 1952. The Cleveland Lost Chord Club, founded in 1947, and the Anamilo Clubs of New York and Detroit, together with groups from St. Louis, Chicago, Philadelphia, Kansas City, Georgia, Florida, and Toronto,

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Canada, formed the Association in order to promote the welfare of persons who had lost their voices as a result of cancer of the larynx. Today the Association has 60 affiliated member clubs and 20 nonaffiliated clubs not only in the United States, but in Australia, New Zealand, South Africa, Japan, France, and England. The mailing list of the Association, which is supported financially by the American Cancer Society, contains the names of 5,500 laryngectomees. The Fédération National des Laryngectomisés, Marseilles, France, has 10,000 laryngectomees on its list. It has been estimated that there are 15,000 laryngectomees now living in the United States.

The goal of these Lost Chord clubs is to assist newly laryngectomized persons to make early adjustments to loss of voice and to overcome psychosocial problems. They accomplish this in two ways: first, by serving as hosts for the newly laryngectomized persons at the club meetings; and second, by collaborating with the surgeons in the preoperative and postoperative speech orientations. Patients and surgeons agree that these services are of prime importance in restoring the laryngectomee to society.

Shortly after the patient is told that he has cancer of the larynx, the surgeon requests a club member, who is well adjusted and a good speaker, to call upon the patient. The visiting club member, a person who has gone through the same experience and is now talking well and working, demonstrates esophageal speech and urges the patient to practice swallowing air and pronouncing vowels and short words as often as he can before the operation. Whenever possible, the patient is also shown a motion picture, such as *New Voices*, *You Can Talk Again*, *Post-laryngectomy Speech*, or *The Irritating Angel*. Each of these films portrays a patient's recovery after operation, his enthusiasm for speaking, and his return to business. The film answers quickly and vividly some of the questions that come to the mind of the patient when he is told he has cancer. "Will I live?" "Will I talk again?" "Will I be able to keep my job?" "Will my family suffer?" The motion picture serves the same purpose for the wife or other relatives who view it with the patient.

The surgeon requests that the club members pay a second visit to the patient about 4 or 5 days after laryngectomy. At this time, the patient may be seriously depressed because he fears he will never talk again. He is frightened about many anticipated problems. Again the visitor discusses speech and tells the patient that he too was depressed; he too had a lot of mucus that had to be pumped out. He says: "Don't worry, you'll be walking around like a new man in a few days." He invites the new patient to the Lost Chord meetings and tells him that he will meet many good talkers who are eager to help him to talk again and to get back on the job.

The surgeon next sends the patient to the speech therapist. The first formal session reveals the importance of preoperative orientation; the patient may have already acquired the ability to produce the basic vowels or even to say a few one-syllable words. With this fine start, he may be talking fairly well in 4 to 6 weeks. Unfortunately, others have much difficulty in producing the first speech sound; they may take 6 to 8 months. Some never learn to talk. About 40 per cent of the patients withdraw from speech training before they have learned to talk.

Acquisition of adequate esophageal speech depends upon what is and what is not done to and for the patient. One of the most debated subjects is the relationship between the type and amount of surgery and successful speech. One group insists on preserving as much of the speech mechanism as possible, and even creating sites for compressing air in order to simplify the learning of speech. Another group insists that the surgeon must cut out all cancerous tissue to save the life of the patient, regardless of how its removal may affect speech. Still another group of research workers has recently determined that there is *no* relationship between the extent or type of operation and successful speech. Hence, other factors must be responsible for the patient's failure to learn esophageal speech.

Inability to use esophageal speech indicates that the patient has not acquired a pseudo-voice. This means that he has not been able to manipulate air, first by compressing it into a small area, and second by expressing it sharply to produce the basic voice. Obviously if the physical structure is not a potent factor in learning this pseudo-voice, the method of teaching must be. In my opinion, preoperative speech therapy is highly beneficial to early acquisition of esophageal speech. Preoperatively, the patient can easily isolate the actions of breathing and the use of the esophagus for speech production. If he is able to learn well the technique of swallowing air before the larynx is removed, he will find it easier to perform a similar action after laryngectomy. My experiences and those of others with these patients bear this out. However, some patients do not benefit by this orientation. Hence, the methods of teaching must be questioned. In the early years of speech therapy, it was my practice to present only the swallow-belch technique to all patients, but it happened that many of them eventually used variations of this method. Some even insisted that they neither swallowed nor belched! It is now the consensus of teachers' opinion that they should present all the known methods of initiating esophageal speech in order to give the patient opportunity to try them out and decide which one he can use most easily.

Three outstanding methods are available for demonstration to the patient: the swallow-belch, the aspirate, and the injection methods. The *swallow-belch method* has been criticized because the speech has an undesirable belch quality, and because of a time delay between the swallow and the belch that interferes with fluency and intelligibility. The full swallow also creates other disturbing conditions. The early literature indicated that the swallowed air was forced into the stomach. The air ball was seen to decrease after the belch and with continued use the site of the vibration appeared to move upward and eventually to remain at the level of the cricopharyngeal muscle. But I have observed another aspect of the swallow-belch: Excessive swallowing of air, which may occur after operation, has undesirable effects upon the gastrointestinal tract, with or without the use of esophageal speech. Among 23 patients with chronic gastrointestinal symptoms who underwent laryngectomy, 20 (87 per cent) had an aggravation of their symptoms postoperatively. Among 54 patients with no gastrointestinal symptoms before, 41 (76 per cent) acquired symptoms afterward. Within a year, the number of items of gastrointestinal distress in all 77 patients was twice the number before operation. Some of my students had so much gastrointestinal distress that they had to discontinue speech therapy; and eventually they re-

sorted to an artificial larynx. Thus, the swallow-belch technique for several reasons might be regarded as undesirable; not only because of poor voice quality and lack of fluency, but because of distressing gastric symptoms.

The *aspirate or inhaling technique* is regarded as the natural method because it is not necessary to dissociate the tendency to breathe out during speech from the breathing out during use of the pseudo-voice. Research has shown that all laryngectomees photographed while talking showed simultaneous breathing out and voice production. The user of this technique may remain relaxed in neck and face muscles and thus avoid developing undesirable grimaces. He uses less energy, may have an easier control of the trapped air, and may attain much more fluency than with the swallow-belch method.

The *injection technique* is used by a large number of esophageal speakers, many of whom cannot explain how they do it. Some speakers claim they do not swallow air, yet motion picture studies indicate that the air which is injected descends far enough into the upper esophagus to be ejected as the pseudo-voice. The essential action consists of trapping or locking air between the back of the tongue and the hard and soft palate, and suddenly forcing it backward into the hypopharynx and down far enough into the esophagus to be entrapped there before ejection. The locking action is preceded by producing the whispered *t-t-t*, then gliding to *s-t* which fixes the tongue in a final position for the light swallowing action of moving the tongue upward against the palate after the manner of producing a *k* or *g*. A slightly different type of injection is to compress the lips and cheeks while tensing for *p* or *b*, which action forces the air backward as described above. Many speakers who use this method are observed to protrude their lips slightly just before they speak.

Given this assortment of ways and means of initiating esophageal speech, every patient would appear to be able to gain adequate speech quickly. But this is not wholly true. Those who anticipate quick success in talking are disappointed and impatient over delay; some never learn to talk. Others require 6 or 8 months to gain fluent speech. Teachers have given numerous reasons for these failures. For example, it is argued that removal of an excessive amount of tissue is responsible for failure. Persons who have undergone removal of the upper third of the esophagus and parts of the pharynx or tongue would seem destined to failure, but a few such persons have talked. As mentioned earlier, one investigation determined that there is no relationship between the extent or type of surgery and postoperative speech.

The majority of teachers argue that motivation is an important factor in success or failure. The value of the preoperative and postoperative orientation and the importance of the Lost Chord club programs have already been discussed. Important likewise is the manner in which the surgeon, aided by his surgical team, provides a picture of the changes the patient should expect in the physiology of breathing, eating, and speaking. Where hospitals of the Veterans Administration have complete service, the social worker's duty is to anticipate and treat emotional and psychological problems of the laryngectomees.

The patient's home environment also is important in motivating him to succeed. Success or failure often depends on the attitude of the wife toward her

husband's handicap and his effort to talk. I have rarely seen a widower or a person who lives alone become a successful speaker. Someone must be around to encourage, inspire, or literally drive him to practice the many thousands of times that are necessary for success. The Lost Chord clubs also make their contribution toward this end. They have auxiliary groups of the wives of laryngectomees who discuss ways and means of inspiring their husbands to work on their speech. They also have visitors who call on the wives of prospective patients in order to assure them that the loss of voice need not be the tragedy that is imagined. They request the wife to telephone them at any time regarding any problem. Thus assured by friendly wives, the wife intelligently manages her household affairs in a manner that will ease the stress and strain placed on the husband through his ordeal from cancer.

One of the strongest motivating forces to speak again is the desire to get back on the job. Such a highly motivated person will succeed in spite of all difficulties. Persons with great drive and determination attack their speech problems as systematically and as vigorously, and with the same enthusiasm as they used in making their lives successful. It must therefore follow that persons with little drive and motivation are less likely to talk well.

Return to work before fluent speech is acquired may prevent further development of speech because the laryngectomee, in his struggle to make good, develops bad habits and uses unintelligible speech. His fellow employees reject such speech; thus discouraged, the patient refrains from talking and resorts to writing or whispering. Laryngectomees who have important business positions, or who supervise others or communicate with many people daily, may be impelled to purchase an artificial larynx. They subsequently may not learn to use esophageal speech, although I have observed that about 50 per cent of them do. The laryngectomee who uses an artificial larynx must not be condemned, because he very often speaks more intelligibly than with his pseudo-speech. Indeed, research has shown that speech with an artificial larynx is more intelligible to auditors than is esophageal speech. Also, we must consider the pressure placed upon such a laryngectomized employee to exert his authority over others, or to maintain his status within his profession. Weak, elderly people, or those who are too ill to learn speech should be advised to use an artificial larynx. Patients who have a long period of training or of plastic surgery ahead of them should use an artificial larynx as soon as it is feasible.

The need for re-establishing communication for social and vocational purposes is so strong that deprivation of speech may precipitate depression, withdrawal, and reluctance to return to work. Hence, if there is any indication of a delay in restoring speech, or if a patient has not learned speech within 90 days, the surgeon and teacher should seriously consider prescribing an artificial larynx. Under these circumstances, and considering the fact that 40 per cent of laryngectomees do not talk well, the objections to the use of an artificial larynx are not acceptable. Some objections are that the voice is artificial, unpleasant, and monotonous; the devices place the patient in a position as a curiosity in public; they require the use of hands, and the patient is encumbered with heavy batteries. Nevertheless, these objections are far outweighed by the advantages of satisfying

communication, relief from the dreaded loss of voice, and retention of employment.

Laryngectomees more than 60 years of age are less likely to learn esophageal speech than younger persons. Advanced age, with poor health and slowing up of physiologic and mental abilities, is not conducive to successful speech. Unskilled workers near retirement age use the loss of voice as an excuse to retire early. This self-imposed isolation reduces speaking opportunities. Furthermore, if the laryngectomee has lost his job and is faced with a sharp reduction in income, or if he has paid out most of his life savings for hospital and medical expenses, the threat of disaster overwhelms any desire to talk again. These problems, together with loss of prestige and lessened ego-satisfaction, are psychodynamic factors that contribute to inadequate speech development. However, a highly motivated, older patient will succeed in talking in spite of all obstacles. Perseverance, practice—thousands of hours of it—a favorable attitude to speech, and determination to talk, are the criteria for successful communication by pseudovoice.

Frustration and embarrassment are other causes of failure. The first attempts to communicate may be so unsatisfactory that the speaker becomes discouraged and depressed. If he withdraws from communicating he gives himself less chance of steadily improving his speech. Reduced opportunities mean less practice, and less practice leads to disuse. Many of these tragedies can be traced to improper orientation of the patient and to improper teaching. Many laryngectomees have been "graduated" by their teachers when they have learned to belch and say a few words. They are told the rest is up to them. It is fortunate that some succeed under these circumstances, unfortunate that others struggle in vain. They acquire facial grimaces and chopping of jaws in their struggle to talk, or they talk too fast and resort to whispering at the ends of words and sentences. Attempts to communicate at this early stage are fraught with failure. They cannot communicate with confidence if they do not have fluency and intelligibility. Hence, it is imperative that teachers urge patients to continue speech therapy until they have obtained the requirements of good speech: fluency, intelligibility, accent, inflection, and phrasing. If the teacher is a laryngectomee and is untrained in basic speech principles, the patient should be guided later by a teacher who knows the basic principles. Better still, it is wise for the two teachers to work together closely.

The Lost Chord clubs offer laryngectomees the greatest opportunity for improving speech. Part of each session is devoted to speech instruction and improvement. Some clubs have trained speech pathologists, but most of them have members, laryngectomees who are good talkers, assist the new patients in initiating speech. The work is facilitated by use of tape recorders. Group work consists of exercises to increase the number of syllables produced after one injection, to develop completion of the final syllables in a phrase, or to pronounce the final consonants in words. Speech practice is made more enjoyable by participation in group singing of popular songs.

Another important service of the clubs is the exchange of ideas about wearing apparel, use of stoma covers and other devices to protect the breathing tube.

Most clubs have an understanding that members be dressed neatly and in a manner to conceal the stoma and signs of surgery. This habit adds to the new patient's impression that the club members have made a complete adjustment.

The clubs hold meetings monthly throughout the year in order to receive the steadily increasing number of newly laryngectomized persons who need moral support and encouragement from those who have succeeded in recovering their own emotional security and social confidence after similar surgery. New members have admitted that their hopes for regaining speech were sharply heightened when they met and heard so many persons talking and visiting in a casual manner. The mottos of these clubs are varied. Examples of some are: "Helping the other fellow," "Serving others." The motto of the Cleveland Lost Chord Club is: "Thank God He has given us two voices in a single life time." The Anamilo Club stands for "We talk again." Membership in the clubs range from 4 to 350.

The unique feature of the early clubs was that they were spontaneously formed by laryngectomees who had been given therapy by the same teacher, or at the same speech center. In the past few years, more and more clubs have been founded by the local chapters of the American Cancer Society, who have furnished rooms for the meetings and have paid teachers to give speech lessons free of charge to club members. Volunteer workers have made and distributed stoma bibs to the members. A "Laryngectomee's Manual," distributed by the International Association of Laryngectomees to every state and local cancer society chapter, served as a guide to the development of Lost Chord clubs. The American Cancer Society has also sponsored the printing of two speech manuals, one written by a speech pathologist and one by a laryngectomee. A copy of each may be obtained from the Society.

When the American Cancer Society saw that the International Association of Laryngectomees had proved its worth in rehabilitating persons who had been cured of cancer, it offered to give it permanent financial support. An executive secretary was employed in 1958 and the *I.A.L. News*, started in 1954, became a world-wide publication. The expression "world-wide" is used justifiably because the officials of the American Cancer Society have accepted the challenge that a world-wide attack on cancer of the larynx should be one of the major goals of the two organizations. They are now in the process of a nationwide survey to determine the yearly number of laryngectomies performed and to inquire into the following items: types of surgical removal of the larynx, extent and value of hospital visitation by rehabilitated laryngectomees, presence or absence of speech instruction, degree of success in speech acquisition, causes of unsuccessful speech, psychologic and physiologic problems, financial and occupational problems, and correlation of income, smoking, drinking, and occupation with cancer of the larynx.

When this information has been evaluated, we will know a great deal about the problems of the laryngectomized patient and can make a direct attack on the most serious obstacles to his rehabilitation. It is indeed fortunate for the laryngectomees that the American Cancer Society has stretched forth its strong hands to help them. In return the American Cancer Society has the opportunity of presenting to the public many examples of cured cancer and of rehabilitated

cancer victims. This is indeed good ammunition for cancer crusades. In fact, thousands of local Lost Chord club members participate in the annual campaigns of the American Cancer Society. Thus, this practical wedding of the two organizations has been mutually fruitful.

A most recent cooperative venture of the two organizations was the First I.A.L. Institute for Voice Rehabilitation, held in St. Louis at the Central Institute for the Deaf. Thirty trainees for speech teaching, 10 speech pathologists, and 20 laryngectomized persons were given a 3 week intensive course in anatomy, psychology, physiology of speech, and practice teaching. The trainees came from 22 different states and were selected on the basis of need for teachers in untouched areas. Nearby hospitals, cancer societies, and bureaus of vocational rehabilitation sent 25 patients to be given speech training. This program was largely supported by the Office of Vocational Rehabilitation of the United States Government and in part by the American Cancer Society. The institutes are to be given annually in order that every area in the United States can be serviced by teachers.

As the teaching of esophageal speech spreads throughout this country, it is anticipated that many new Lost Chord clubs will be organized, making a much larger Association of Laryngectomees. But as the name implies, the Association is composed of clubs from all over the world. It is hoped that through this meeting of persons interested in the welfare of crippled people, many groups from other nations will join the International Association of Laryngectomees. Truly then, as the local, national, and international philosophy will be that every man wishes to help his fellow man, so will states and nations help each other.

REHABILITATION FOR THE DISABLED IN GREAT BRITAIN

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ACCORDING TO the dictionary, to rehabilitate is to reinstate, to restore to former privileges, to make fit after disablement for earning a living or playing a part in the world. Rehabilitation, therefore, is a very wide term: it can be applied to individuals and to nations.

Today we are considering its application to individuals, to those who by birth, accident, or disease are unable to take their normal places in the world without help.

Many are disabled by injury and their treatment sometimes requires a long stay in the hospital. For the severely injured person rehabilitation commences when he becomes a patient in a hospital, but the rehabilitation process may continue after hospital treatment is concluded.

This process, therefore, may be divided into hospital and posthospital rehabilitation. All agree that hospitals should be as efficient as possible, but for this there must be more than merely efficient technical treatment, important though this is. In addition, a spirit of hopefulness must be created in the mind of the discouraged patient. In this way a severely injured person can be helped to avoid the feeling, all too easily acquired, that he is "done for" and that, as far as work is concerned, he is "finished." The truly efficient hospital can, therefore, ensure that the first step in rehabilitation has been taken and that the patient has made a start on the road to recovery.

It was Sir Robert Jones, the great orthopedic surgeon of World War I, so well-known and respected on both sides of the Atlantic, who pointed out and emphasized the importance of patients doing active, useful exercises while undergoing treatment, taking in fact an active part in helping themselves to recover, not merely resigning themselves to passive treatment.

Most of the larger hospitals have departments of occupational therapy. The apparatus in these departments can be built or modified in such a way as to necessitate, in using them, active movement of weakened muscles or stiff joints.

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For example, in the occupational therapy department where a small, specially-designed kitchen is installed, the disabled housewife can do much to make herself fit for active work when she returns to her home.

The severely injured can be divided into three groups: (1) those who return to their preaccident work without delay when their hospital treatment is completed, (2) those who return to their preaccident work with help or special training, and (3) those who cannot return to their preaccident work but can be trained for alternative work.

Those who return to their normal work may at first find some difficulty in doing, under factory conditions, what they did before their accident occurred. Some factories, such as the Austin Motor Company of Great Britain, have tried to meet this problem by modifying some of their machines so that a disabled person can use them and in so doing gain both strength and speed.

For those working where no such facilities exist, the British Government has set up what are known as Industrial Rehabilitation Units which can be of great value and which may be residential.

Industrial rehabilitation, in my experience, has two main functions: The first of these is to give confidence and working speed to an injured man. At these units manual workers are able to do the same or similar work to that which they will do when they return to industry. If, for example, a man has to work as part of a team in which speed is of great importance, he can practice his normal work at the Industrial Rehabilitation Unit. This should help him to get back to full work at his preaccident job without what could be a demoralizing period of light work. The second function is to assess the capabilities of those who are not fit to return to their preaccident work.

Once it is recognized that a man cannot return to his former occupation the essential thing is to decide what alternative work he can take up, what he can happily and satisfactorily do in order to earn a livelihood. To enable him to choose that work and get advice about it, a period in an Industrial Rehabilitation Unit is very useful. There a man's capabilities can be assessed. He can try his hand at work which he fancies and when he leaves at the end of 6 weeks he will often be fit to undergo a course of training in the work that he has chosen. Having chosen a new occupation, he can be recommended by the Ministry of Labour for admission to a training center.

If he is accepted he will be sent free of personal expense by the Ministry of Labour to either a Government workshop or a residential college. The residential vocation training colleges, of which there are four in Great Britain, specialize in training the disabled. They have been built or buildings have been purchased with money raised by voluntary contributions, but they are supported in the main by the Government payments for maintenance and training. Here we have an example of the cooperation between the State and voluntary bodies which has been such a fruitful source of advancement in the development of social welfare in Great Britain.

Some of the men accepted for training are found to have not had sufficient general education to enable them to take a course of training. To these, special general education is given before training is commenced. It is surprising what

progress middle-aged or even older men are thus able to make so that they can, without difficulty, undertake the training suggested.

One of the great advantages of a residential training college is that the men or women who come into residence not only learn a new trade but also, by living a community life with others disabled like themselves, may get new courage and hope and find themselves able to do things which they would never have thought possible.

So far, I have referred mostly to the injured workman, but the scheme for rehabilitation applies equally to children. Teaching is available for the physically handicapped child. Every Local Education Authority is required to ascertain which children in its area require special education because of their physical condition. This process requires the cooperation of the parents, teachers, and the local medical officers.

The Local Education Authority has the duty of providing education for every child suited to its age, ability, and aptitude. For some this means going to special schools, for others it means going into hospitals for special treatment. All require education. If a severely disabled child is unfit to go to a normal school or to be admitted to an institution, the Local Education Authority will provide teachers for instruction in his own home. Some children require further education after leaving school. Normally they leave special schools at the age of 16; when they do so they can be helped to find jobs and, if they are disabled, can be given special training.

Having mentioned some of the facilities and the general plan of dealing with the disabled, I now shall refer to certain aspects of the problem in more detail.

EMPLOYMENT SERVICES

Following the Report of the Inter-Departmental Committee on the Rehabilitation and Resettlement of Disabled Persons, the Disabled Persons Employment Act was passed in 1944. This Act, upon which the work for the disabled has been based, is not concerned directly with the medical and social aspects of disablement although closely linked with them. It is designed to meet the disabled person's specific need to work and the need of the nation for such a person's productive capacity. It is an Employment Act administered by the Ministry of Labour which has the duty of helping disabled persons to take up employment. A disabled person is defined as one who, on account of injury, disease, or congenital deformity, is substantially handicapped in obtaining or keeping employment, or in undertaking work on his own account of a kind which, apart from that injury, disease, or deformity, would be suited to his age, experience, and qualifications. The Act makes special provision for the disabled in the following ways:

1. It requires the Minister to maintain a register of persons who are substantially handicapped by reason of their disability toward obtaining or keeping employment (the Disabled Persons' Register).

2. It requires every employer who has a substantial number of employees to include among them a proportion of registered disabled people (the Quota).

3. It empowers the Minister to reserve for the disabled certain kinds of work (Designated Employment).

4. It authorizes the Minister to appoint officers to carry out the special purposes of the Act (Disablement Resettlement Officers, D.R.O.).

5. It authorizes the provision of sheltered employment for the severely disabled, that is, for those who are capable of employment but unable to compete with nondisabled workers under ordinary conditions (Sheltered Workshops).

6. It authorizes the setting up of a National Advisory Council and of Local Disablement Advisory Committees.

7. It provides for courses in industrial rehabilitation to be given where this will enable the disabled person to bridge the gap between leaving the hospital and going back to work or will tone him up for work after a long period of illness.

8. It provides for vocational training to be given where needed.

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DISABLED PERSONS' REGISTER

Registration is voluntary; a person who wishes his name to be entered on the Register must make an application to that effect. For an application to be successful the main conditions that an applicant must satisfy are: (1) that he is disabled within the meaning of the Act and that the disablement is likely to last for at least 12 months, (2) that he is above the legal age for leaving school, (3) that he is ordinarily resident in Great Britain and wishes to work in some form of remunerative employment or on his own account in Great Britain, and (4) that he has a reasonable prospect of keeping such employment or work.

THE QUOTA

The obligation is laid upon all employers of 20 or more employees to include a proportion of disabled workers which must be not less than 3 per cent. An employer who has a quota obligation which is not fulfilled may engage a worker not registered as disabled only if he has a permit from the Minister to do so. No employer may discharge a registered disabled person without reasonable cause if this would leave him below his quota.

DESIGNATED EMPLOYMENT

The Minister has power, after consultation with employers' and workers' organizations, to designate kinds of employment if they appear to him to afford specially suitable opportunities for the employment of a disabled person. Only the two occupations of parking attendant and operator of electric passenger elevators have so far been designated.

DISABLEMENT RESETTLEMENT OFFICER (D.R.O.)

The resettlement of a sick or injured worker in employment is only one phase in a continuous process, part of which have already been mentioned. The full process comprises the initial medical and surgical treatment, the restoration

of health, the assessment of future working capacity, the rebuilding of lost confidence, and any necessary instruction in some new kind of employment.

The employment service inevitably overlaps to a degree the later stages of the medical rehabilitation provided by the National Health Service. The link between the two is the D.R.O. At each local office (Employment Exchange) of the Ministry of Labour there is at least one Disablement Resettlement Officer who is engaged in cooperation with other officers in carrying out the Ministry's policy for the resettlement of the disabled. His special duties include advising disabled persons and helping them to obtain suitable work. The D.R.O. is guided in his attempts to find the most suitable employment for the disabled by the principle that the most satisfactory form of resettlement for a disabled person is in employment which he can take and keep on his own merits as a worker in normal competition with his fellows.

An important part of the Disablement Resettlement Officer's work is to keep in touch with local employers. Also, he needs medical advice and guidance in determining the employment capacity of each disabled person. He visits hospitals and other institutions to interview and advise patients about to be discharged with a residual disability. In some hospitals resettlement clinics are held which form a part of the hospital services in which almoner, doctor, and D.R.O. are called in together to consider the problems of these patients.

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SHELTERED EMPLOYMENT

Some disabled persons who are unlikely to be able to hold employment under ordinary industrial conditions because of the nature or severity of their disablement are capable of useful work if given sheltered employment. Special facilities for this have been provided by many voluntary organizations. The resources of voluntary undertakings cannot reasonably be expected to prove sufficient to meet the need of disablement from all sources on a national basis. There are three ways in which these sheltered conditions can be provided: (1) by a nonprofit distributing company specially set up by the Minister for the purpose (Remploy Limited); (2) by voluntary associations or bodies with workshops or other facilities of the requisite standard; and (3) by local authorities acting under their statutory powers.

REMPLOY LIMITED

In 1945 the Minister of Labour used his powers under the Act to set up in Great Britain a special company to provide sheltered employment. This company, originally known as the Disabled Persons Employment Corporation, is now known as Remploy Limited and its factories as Remploy factories. Remploy Limited is a public company incorporated under the Companies Act of 1929, required by its constitution to apply its income (including any profits) to promoting the object for which it was formed and prohibiting payment of dividends to its members. Government loans are made to the company to cover capital expenditures; loss on operation is met from public funds. It is an

independent enterprise, subject only to general policy and financial control exercised by the Minister in discharging his responsibility to Parliament. The Board of Directors is appointed by the Minister and includes Trade Union leaders and persons of standing who combine industrial and commercial knowledge likely to be of service to the Company with a close interest in the problems of the disabled. Management is vested in four full-time directors. The Company operates as a commercial concern engaged in ordinary productive and trading activities but with the object of providing employment under conditions suitable to the severely disabled. It aims to meet its operating costs out of sales in the open market and is not a charitable undertaking.

There are at present 90 Remploy factories throughout Great Britain, giving employment to 6,000 disabled persons.

VOLUNTARY ASSOCIATIONS

Assistance can be given by the Ministry to approved voluntary undertakings developing schemes to provide sheltered employment for disabled persons registered under the Act. The forms of assistance available are: (1) training allowances for a severely disabled person before he can be expected to earn, or the employer to pay, wages; (2) training grants paid to an undertaking on a per capita basis (the purpose of these grants is to meet the cost of instruction and the wastage of material; they are normally subject to the undertaking giving employment to a disabled person when his training is complete); (3) deficiency grants paid to undertakings employing disabled persons to meet a part of any trading loss incurred; and (4) capital advances made to enable an undertaking either to start an employment scheme for severely disabled persons or to develop its existing facilities for that purpose.

LOCAL AUTHORITIES

The Act also provides for the Minister to make grants to local authorities who are providing employment facilities under statutory authority.

GRANTS TO SET UP IN BUSINESS

Some disabled persons who are unfit for ordinary employment and for whom local sheltered employment cannot be provided can work satisfactorily on their own account. Provision for assistance in this kind of case is made to some extent under a home workers' scheme by Remploy Limited, voluntary organizations, and local authorities. In exceptional cases, help may be given by the Ministry of Labour to assist a severely disabled person to start his own business.

PROFESSIONAL AND BUSINESS TRAINING FACILITIES

Arrangements exist for the provision of facilities for professional training for disabled persons with the ability and educational qualifications for training in a profession or a comparable calling.

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OTHER SOCIAL SERVICES

The Industrial Injuries' scheme which has succeeded the Workmen's Compensation system came into being in 1948. It is a compulsory insurance scheme under which contributions are paid by the insured person, the employer, and the State.

The contributions go to a special Industrial Injuries' Fund from which expenses are paid. The scheme is administered by the Ministry of Pensions and National Insurance which has some 900 local offices in Great Britain. It applies, broadly speaking, to everyone working for an employer under contract of service and covers personal injury arising out of and in the course of insurable employment and certain specific industrial diseases. There is a special system of adjudication which provides for independent authorities appointed under the terms of the Acts including medical boards and medical insurance tribunals to give decisions on questions relating to benefits. The three main benefits provided are injury benefits, disablement benefits, and death benefits.

There is a standard weekly rate for adults with increases for dependents.

Special increases in disablement benefits may be payable in certain circumstances. These are: (1) a special hardship allowance for a claimant who is unable to resume his occupation or do work of an equivalent standard as a result of injury or disease, (2) constant attendance allowance for a person in receipt of disablement benefit at the 100 per cent rate who is so disabled that he needs someone to help him with the ordinary necessities of life, (3) unemployability settlement for a person rendered permanently disabled or only able to earn less than 52 pounds per year, and (4) hospital treatment allowance to bring disablement benefit up to the 100 per cent rate during treatment as a hospital inpatient for the disablement.

The National Insurance Act of 1948 consolidated and improved the existing insurance provision. It provides for cash benefits in various circumstances, including unemployment and sickness. Payments are not subject to necessity but are subject to the previous payment or credit of contributions. The Act applies to almost everyone in Great Britain over the legal age for leaving school.

THE NATIONAL ASSISTANCE ACT OF 1948

Under parts 2 and 3 of this Act two principal services are provided, one administered by the National Assistance Board and the other by local authorities who exercise their functions under the general guidance of the Ministry of Health. In the scheme of National Assistance, grants are made to those in need and to those whose needs are not fully met by National Insurance Acts. Under the general guidance of the Minister of Health, the following welfare services may be provided by a local authority:

1. Residential accommodation for the aged and infirm and others in need of care and attention.
2. Arrangements for the welfare of those who are permanently handicapped.

The Councils can under this Act:

1. Assist the handicapped to overcome the effects of their disabilities;

2. Give advice and guidance to the handicapped on personal problems;

3. Encourage the handicapped person to take part in the activities of social centers; and

4. Use their best endeavors to arrange for voluntary workers to visit handicapped people to afford them comfort and encouragement in the solution of domestic and other problems confronting them and otherwise assist in the purpose of this scheme.

In addition the Council may:

1. Provide for practical assistance for handicapped persons in their homes;

2. Provide or assist in obtaining radio, library, and similar recreational facilities in their homes;

3. Provide for lectures, games, outings, and other recreational facilities for handicapped persons in social centers;

4. Provide or arrange for the provision of special religious services for handicapped persons desirous of taking advantage of them;

5. Provide facilities for and assistance to handicapped persons in traveling to and from their homes to participate in any of the services provided under this scheme; and

6. Facilitate the taking of holidays by handicapped persons in particular at holiday homes whether provided by the Council under this scheme or otherwise, and if the Council so determine to defray any expense incurred in or in connection with the taking of such holidays.

SOCIAL CENTERS AND HOLIDAY HOMES

The Council may provide social centers and holiday homes for the purpose of this scheme.

With so many schemes for helping the disabled it is quite possible that some of those entitled to take part may, through ignorance or for some other reason, not obtain the benefits to which they are entitled. For this reason and in order to coordinate the facilities available, in many areas in Great Britain local associations for the welfare of the physically handicapped have been established. These are usually formed in association with the Central Council for the Care of Cripples, whose headquarters are in London. The objects of the Central Council are to promote and support measures for the early discovery, prompt and efficient treatment, education, training, and general welfare of cripples of all ages. It maintains touch with all international work and acts as central bureau of information. It has a national status in Great Britain and its main functions are planning, organization, and development. The object of the local associations is to ensure that throughout the country there are complete facilities for the rehabilitation and welfare of all the physically handicapped and that they are fully understood by those who need them.

It is difficult in a short time to give a complete picture of the work that has been and is being done for the disabled in Great Britain. Certainly the foundation of the work has been well and truly laid and the relatively rapid improvement made in the attitude toward and care of the disabled has been very impressive.

In 1953 a Committee of Inquiry was set up by the Government under the Chairmanship of Lord Piercy to review the facilities for rehabilitation, training, and resettlement of the disabled. The report of this Committee was published in November, 1956, and was the first review since the 1943 report of the first Committee.

The general verdict was that the statutory provision of services for the disabled and facilities for enabling them to get suitable employment was comprehensive, well established, and needed little change. It found evidence of widening and deepening of the concept of rehabilitation on the medical side, although the development of rehabilitation facilities still left much to be desired.

The last report issued by the Minister of Labour on the resettlement of disabled persons was for the year 1958. This showed that from the peak of 936,000 registered disabled persons in October, 1950, there was a drop to 731,000 in 1958. Of these registered, 643,000 were men and boys and 88,000, women and girls, although the number of boys and girls was very small. Forty per cent of the men owned their disabilities to war service, compared with less than 5 per cent of women; 15 per cent of the men had been disabled by industrial accidents and diseases, compared with 5 per cent of the women. Men and women disabled from birth or early childhood accounted for nearly 31,000 (about one-third) of the women; 65,000 (about one-tenth) of the men.

The following is an analysis of the previous employment experience of those entering Industrial Rehabilitation Units:

	PERCENTAGE OF ENTRANTS
Administrative, professional, and technical workers	1
Foremen and supervisors	1
Service and transport workers	17
Clerical workers	6
Skilled craftsmen	14
Production workers (not skilled)	24
Laborers	33
No previous employment	4

It is interesting, therefore, to note that 61 per cent of the men entering these units were either unskilled or had had no previous employment.

The number of severely disabled workers, including home workers employed in the Remploy factories, was 6,158, compared with 6,299 in the previous year. The company achieved a substantial increase in both production and sales and at the end of the year the sales were running at the annual rate of approximately 4,000,000 pounds, compared with 3,369,000 during the fiscal year ending March 31, 1958.

The experience that we have gained in Great Britain is that only a small proportion of the disabled need sheltered workshop conditions to enable them to live happy and useful lives. A large proportion can, if trained for work within their capacity, compete on equal terms with the physically fit in industry. They prove to be efficient and reliable workers who can make a normal contribution to the welfare of the community. In a world beset with so many difficulties

it is encouraging to find that the care of the disabled is based on a solid foundation, that much has been accomplished, and that if we proceed on the lines laid down, the result should be even greater success in the years to come.

(Much of the information embodied in this paper has been obtained from "Services for the Disabled." published for the Ministry of Labour and National Service by Her Majesty's Stationery Office, London, England. This gives a detailed account of the facilities available in Great Britain for the physically handicapped.)

THE CONTRIBUTION OF THE HANDICAPPED TO THE WORLD ECONOMY

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WASHINGTON, D. C.

From the Office of Vocational Rehabilitation, Department of Health, Education and Welfare

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FOR MANY years I have enjoyed the warm hospitality and the privilege of working and learning at the side of leaders in rehabilitation in many countries. In those years it has been heart-warming to see rehabilitation grow into national purposes in many places and evolve into a strong international movement.

Today it is my great pleasure, as Director of the public program of vocational rehabilitation in the United States, to share with you some of the experience gained in our own program. Through the excellent world leadership of the International Society for the Welfare of Cripples, and now through this Eighth World Congress, we have a splendid opportunity to pool our experiences among nations and thereby create better futures for the handicapped people of the world.

The place of the handicapped worker in the world economy deserves our attention, for this is a subject which influences the lives of millions of people and the fortunes of many nations. We cannot disassociate the work we do from the dreams and hopes of new nations struggling toward more secure places in the community of nations any more than we can, in good conscience, ignore the pleas and the needs of the handicapped people who look to us for help and a better life.

When we speak of the world's economy, we are speaking of the product of work—the work of millions of people, both able-bodied and disabled. For this reason I speak to you of this keystone in rehabilitation—the disabled in the world of work. That great world figure in the advancement of medicine, man's ideal of the perfect physician through the years, Sir William Osler, gives me the theme of this paper. *Work* he called the magic word:

> Though a little one, the master word looms large in meaning. It is the "open sesame" to every porthole, the great equalizer in the world, the true philosopher's stone which transmutes all the base metal of humanity into gold. The stupid man among you it will make bright, the bright man brilliant, and the brilliant student steady. With the magic word in your heart, all things are possible, and without it, all study is vanity and vexation. The miracles of life are with it. The blind see by touch; the deaf hear with eyes; the dumb speak with fingers.

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Work is at once the touchstone by which a human being with seemingly insurmountable handicaps overcomes them to attain the goal at the end of the rainbow—a job.

Last year I attended the first Mediterranean Conference on Rehabilitation in Athens, Greece. Out of the deliberations of the Conference came resolutions of unusual importance, including a statement of the basic right of every handicapped person to vocational as well as medical rehabilitation, with the objective of providing opportunity for development of his highest potentials for physical, social, spiritual, and economic well-being.

In support of this fundamental premise this significant statement was made: that equal opportunity for employment being essential to the stated objectives, legislation to provide social insurance systems should be enacted in each country, incorporating vocational training and placement methods for disabled persons looking toward their eventual total rehabilitation.

At the Mediterranean Conference, we learned, as we have at so many other meetings, numerous things which are of benefit to our program here in the United States. Since then, I have studied with considerable care the factors which help in the advancement of our vocational rehabilitation program in this country, and I am convinced that the greatest contribution which our program has made and can make to other countries is the concept of rehabilitation as a contribution to the productivity of the individual and of the world.

The need for rehabilitation on a world-wide basis is well stated by our beloved President of the Congress, Dr. Howard A. Rusk, who wrote these words last year in an article entitled "Medicine and International Diplomacy."

> In the field of health and rehabilitation, we have a uniquely effective area of service and responsibility for working toward international understanding. Health, including rehabilitation of the handicapped, is fundamental to the prime democratic concept of equal opportunity for all. A world in which good health is enjoyed by only a few is not a politically stable world. How can the man who is crippled by pain and disability stand up and fight for the principles of democracy and freedom? Unless he can work and produce, how can he enjoy the fruits of his labors, and become a customer for the goods which all the world wants to sell him? Unless he can produce and earn and then buy from the rest of the world, how can his standard of living be increased?

This is the case for vocational rehabilitation. It is essentially the basic and unique philosophy of the public program of vocational rehabilitation in the United States. The program is based on work because the ability to earn eliminates or reduces dependency and equalizes other opportunities for a disabled person to assume an accepted place in the community. It was so even in the earlier stage of the public program that was initiated in 1920 in the United States to develop a workable relationship between the state and Federal Governments, primarily for the rehabilitation of those whose disabilities were rooted in industrial hazards.

In the evolution of the public program through the ensuing 40 years there has been no wavering in the principle of work as a therapy and an objective. It is true today more than ever before.

By the close of this current fiscal year, well over 500,000 disabled persons will have been rehabilitated into employment through the public program of vocational rehabilitation in the United States since the standards and procedures in the wake of new rehabilitation legislation in 1954 became operative. One of the standards is that a disabled person is not counted as rehabilitated until his state rehabilitation agency reports him employed to his own satisfaction and to that of his employer.

This, therefore, is the most distinctive feature of rehabilitation in the United States. Useful, productive, self-sustaining work for the handicapped is closely woven into the entire rehabilitation process, for it is a part of therapy, of motivation and psychological adjustment, and of social acceptance and economic independence.

Work is not a separate compartment of a person's life, it is the central structure which gives life purpose and meaning. This powerful influence is even a factor in medical care and in the physical restoration of the disabled person, for it represents the *reason why* of rehabilitation.

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If we have a narrow view of the place of handicapped people in the world of work, if we aim only at placing the handicapped in a few menial tasks, if we are more interested in "disposing of the problem" than we are in bringing the person to the highest and most productive plane he can achieve, then we have missed the true, the great opportunity in rehabilitation.

We have learned through wide experience in the United States over many years, that there are few jobs which cannot be performed by the right handicapped person. As a result, there are hundreds of thousands of handicapped persons at work in this country today performing in every occupational field we have—and doing their jobs as efficiently and reliably as the workers who have no handicap. We attribute much of this to the principle of selective placement—of bringing together the skills of the right handicapped person with the demands of the particular job.

Yet much more is involved than this. The dominant reason that the handicapped are a familiar part of our entire labor force is the fact that we have made a sustained effort to cast off the centuries-old idea that the handicapped person is "different," that he somehow, by acquiring a disability, has lost the attributes of intelligence, skill, loyalty, and perseverance. We have insisted that the disabled person is a person first, and second, a disabled individual. As a person he has every right to assume the same responsibilities and seek the same opportunities as any other citizen, with the right to as good an education as possible, to training for a job, and to a place of equal competition for available jobs for which he is qualified.

This is a concept which more and more of the American people are comprehending and accepting every day. It has been a voluntary movement, an educational process, without coercion or legal stipulations. As a result, the businessmen, the labor organizations, rehabilitation specialists, physicians, governmental officials, and others have been willing to experiment with the hiring of handicapped workers in hundreds of occupations where no handicapped person ever had worked before. Experience has confirmed the concept, and in turn has produced increased willingness to experiment again in other occupations.

We see the handicapped employed today in every segment of America's productivity—in large and small industrial firms; on farms; in retail stores; in business, as employees and employers; in professions, as physicians, lawyers, etc.; in the many service occupations; and in the important task of the housewife and homemaker.

These capable workers may be found in all types of establishments. In a large aircraft plant in California, with a work force numbering in the thousands, nearly 2,000 severely disabled men and women are doing a wide range of tasks, many of them highly technical and commanding high salaries. Also, two handicapped workers may be found in a small dry-cleaning plant, where one operates the pressing machine and the other repairs clothing. Blind persons are operating dairy farms, repairing furniture, practicing law, and sitting as judges.

In the New York area is one of the most impressive examples of the capacities of severely disabled people to produce with high efficiency. I refer to Abilities, Inc., at Albertson, on Long Island outside New York City. Under the inspired direction of Mr. Henry Viscardi, this firm, after only a few years of operation, is producing a great variety of electronic devices and assemblies, using only persons who have such serious disabilities that many firms would consider them unemployable. Mr. Viscardi's company has been organized and operated for one main purpose—to demonstrate to industry and to the people of this country and of the world that handicapped workers can produce successfully in competition with the nonhandicapped. It has been a phenomenal success, both as a demonstration and as a highly successful business enterprise which has made money and has grown.

As we have seen the handicapped absorbed into all parts of our labor force, we have learned the importance of a rehabilitation program which provides the variety of services necessary to prepare a handicapped person for employment. It is a great mistake, we feel, to consider rehabilitation as solely a program to put handicapped people to work. At the moment, there are millions of handicapped persons throughout the world who will never work unless services are first provided to restore physical function, to instill in them the conviction that they will be able to work, to provide training and job skills, and to guide them into the kinds of work for which they are fitted. Without these services, organized and provided in a planned and unified way, we will never rehabilitate or employ more than a small fraction of the handicapped people who could be active and productive citizens. To provide these services in the most effective manner requires that rehabilitation counselors, physicians, physical therapists, occupational therapists, prosthetics experts, psychologists, social workers, and others function together in a common effort which brings all their professional skills to bear upon the problems of the disabled person. In the United States we have various ways of securing such teamwork, particularly through rehabilitation centers where such a professional staff may pool their talents in a united effort.

Through such an approach, the many voluntary rehabilitation agencies of this country, as well as the public program of vocational rehabilitation, have developed constantly improved services which prepare an increasing number of handicapped people for training and employment.

In the vocational rehabilitation program in the United States, the last 6 years have seen new records established annually in the number of disabled persons rehabilitated into satisfactory employment. In the fiscal year that ended June 30 of this year, approximately 88,000 handicapped persons were rehabilitated. This brought to a total of nearly 440,000 the number who were rehabilitated during the last 6 years.

Among these 440,000 persons were more than 21,000 professional people—doctors, teachers, engineers, and others. It is especially interesting to note that many of these disabled people entered occupations in which our country, and most other countries, are now experiencing shortages of competent professional and technical workers. The rehabilitation program is helping to alleviate some of these shortages. In one year, for example, 277 engineers were rehabilitated and placed at work, along with a large number of chemists, trained nurses, and laboratory technicians. At a time when the United States is endeavoring to increase the supply of teachers, the state rehabilitation agencies in one year furnished our country with nearly 1,400 teachers.

About 53,000 disabled persons rehabilitated in the public program went into the skilled trades, and another 39,000 entered agriculture. In fact, almost every trade, vocation, and profession is represented.

There were, for instance, large numbers of painters, sculptors, actors, authors, dancers, musicians, and music teachers. There were physicians, surgeons, dentists, nurses, veterinarians, optometrists, and other professional people in the fields of law, architecture, the clergy, the physical sciences, and social work.

Included were such technical and semiprofessional personnel as photographers, laboratory technicians, draftsmen, commercial artists, interior decorators, athletic instructors, radio and television technicians, and surveyors.

There were hotel and restaurant managers, credit managers, bookkeepers, office clerks, office machine operators, stevedores, and telephone operators. There were post office clerks, auctioneers, and salesmen. There were cooks, nursemaids, waiters, barbers and beauticians, policemen, firemen, janitors, and elevator operators. There were bakers, tailors, woodworkers, printers, machinists, electricians, welders, meat-cutters, railroad engineers, and bus drivers.

In short, these disabled people today are performing in practically every occupation to be found in the United States. The results of such programs, keying rehabilitation to the concept of work, have tremendous implications which go beyond important benefits for any one individual. The transformation of these people from a status of helpless dependency to a place of activity, productivity, and usefulness, has an important influence on the economic soundness of a country, both present and future.

Where disabled people in large numbers are neglected, they constitute both a weakness in our social fabric and a large scale drain on the economy of a nation. It is not possible to make true national progress unless this progress is shared by all the people. We cannot have a healthy economy, national or international, when the productive efforts of one portion of our population must be devoted to maintaining another segment which is unproductive.

Therefore, programs of rehabilitation must be planned which bring the majority of our handicapped people into places of usefulness, based on the principle that they are entitled to, and have the capacities for, useful work alongside their fellow citizens.

Fortunately, we have many outstanding international organizations with which to work as each of our countries makes plans for the future.

Recently a World Commission on the Vocational Aspects of Rehabilitation was established within the structure of the International Society—a step which promises to help tremendously in emphasizing employment as an essential part of all rehabilitation programs for the disabled. This new Commission, which met for the first time in August, 1960, meets a very real need in our cooperative planning between countries, for it will provide a form through which all countries, whatever their stage of technical development, may compare problems and find solutions in the employment of their handicapped citizens.

Along with the International Society, we have seen the World Rehabilitation Fund grow dramatically during the last few years, under the guidance of Dr. Rusk, so that today it is an active and powerful agency in helping to formulate and finance many rehabilitation projects in many countries and it is of vital and indispensable importance in the contribution it has made by providing opportunities for physicians and others to receive training under its auspices here and abroad.

The World Veterans Federation, which incorporates the efforts of many nations in behalf of disabled war veterans, today is an experienced and influential agency in international rehabilitation. The American Foundation for Overseas Blind has been extremely active in giving many forms of aid and counsel to governments and to organizations which work with the blind persons of the world.

The International Labor Organization has long been an active participant in our field of work, and has made vocational rehabilitation a focal point of its planning for member nations.

The United Nations itself, as well as its specialized agencies, provides a basic framework from which many rehabilitation projects and activities can flow effectively. Of these agencies, the World Health Organization has been and is of assistance in a variety of ways in a number of countries.

In developing the concept of work for the handicapped, we have been fortunate in the United States to have the outstanding leadership and educational work of the President's Committee on Employment of the Physically Handicapped. This committee and its affiliated Governor's Committees in all the states have achieved a constantly increasing awareness among business, industry, labor, civic, and other groups of the importance of the handicapped worker as a productive member of the labor force. Today I am happy to say that the President's Committee is taking an active interest in international work for the disabled and I am sure you join me in congratulating them upon their success in securing a commemorative stamp which is being released at the Eighth World Congress. Under the vigorous leadership of its Chairman, Major General Melvin Maas, the President's Committee has made a profound contribution to the work for the handicapped in the United States, and I feel confident of the strong role they will play for the handicapped of the world in the next several years.

The progress being made in rehabilitation, both in this country and abroad, has stimulated mounting interest in the Congress of the United States. To a considerable degree, the response of our national legislators to the opportunities provided by rehabilitation has been due to the dramatic story we are able to tell—not only of the human victories over disablement but also of the gains to our economy by the work accomplished by rehabilitated disabled persons. And so, in a number of ways, our national legislature has taken a direct interest in your work and ours, so that the prospects for international collaboration in rehabilitation have been greatly strengthened.

Of direct interest is the fact that the Congress this year is providing so-called "counterpart funds" as a part of the appropriation for our Office of Vocational Rehabilitation. As many of you know, these foreign currencies are due the United States in many countries of the world as a result of the sale of our surplus agricultural commodities. They are available for use in only that particular country, and for certain purposes. This year we expect to have nearly a million dollars available which can be devoted to rehabilitation research and related activities in nine countries. Plans for the use of these funds to expand rehabilitation research activities are now being developed in cooperation with the nations concerned. I am especially happy that the new World Commission on Rehabilitation Research, established recently by the International Society for the Welfare of Cripples, will hold its first meeting here in New York directly following this Eighth World Congress. It will give us an unusual opportunity to discuss firsthand with the representatives of those countries the types of research and related projects which we may carry on with the use of these foreign currencies during the coming years.

This spring, the United States Congress acted upon proposals to provide for a continuing program of international cooperation in health research, including rehabilitation. In July the President signed into law the International Health Research Act of 1960, through which we expect to conduct expanded programs of rehabilitation research with a large number of countries in many parts of the world.

In another development this year, a Congressional committee issued the first report on international rehabilitation activities ever published by a Congressional committee. I hope most of you have seen this excellent Congressional document entitled "Rehabilitation of the Disabled in 37 Countries," which outlines the major features of the rehabilitation programs' facilities and resources in this selected group of nations. We hope that this publication is a forerunner of additional material which will give all of us a better understanding of the rehabilitation program of the world, so that our cooperation may be based on increased understanding.

Most of us, I am sure, would agree that the progress made in international rehabilitation reflects the fact that economic progress today inevitably goes hand in hand with progress in the social sciences. We are grateful for the many blessings which the industrial development of the United States has brought to our people, but we are very much aware that material progress must be brought into line with social gains in every nation, so that the flowering genius of mankind for

harnessing physical sciences to his advantage shall not be the sole criterion for judging the degree of advancement of civilization.

In our country we have a combined ministry of Health, Education and Welfare. Its motto is *Spes Anchora Vitae*. To all of us in rehabilitation, this motto is our touchstone. As we extend our opportunities to work together throughout the world, we in the United States program will lend our efforts to make that motto—Hope the Anchor of Life—a real countersign for everyone throughout the world.

THE ROLE OF THE VOLUNTEER IN PROGRAM OPERATION AND DEVELOPMENT

ROBERT K. MOONEY
HARTFORD, CONN.

From the Hartford Rehabilitation Center
(Received for publication Oct. 6, 1960)

I HAVE been asked to speak about a typical rehabilitation center in America and the role of the volunteer in its program.

Here in New York one finds the white lights of Broadway. Here is the magic world of the theater. Famous names appear on every marquee. I am sure you would understand my whole thesis if I simply said, "Without the volunteer our rehabilitation show couldn't go on. The volunteer is our star." But such brevity is inadequate; I find the drama of rehabilitation too absorbing to ring down the curtain so soon.

It is my good fortune to be the volunteer President of the Rehabilitation Center in Hartford, Connecticut. We are a local facility of the National Society for Crippled Children and Adults. This experience has shown me that our dependence upon volunteers is in equal measure to our dependence upon our professional staff. I insert this personal history for three purposes: (1) propaganda, for in Hartford we have a rehabilitation center which we consider second to none in the spirit of its endeavor; (2) to invite each of you to visit our Center; and (3) because through my own experience in rehabilitation, I have confirmed a political philosophy that bears upon our discussion. I feel that without volunteer help we in America would have government intervention in such programs. I prefer the aid of volunteers.

Much of what I say will be "old hat" to friends from other chapters of our National Society. But for those of you who are unacquainted with programs of rehabilitation, our use of the volunteer may prove surprising. I hope that you will find in our experience both something typical of America and something fresh which will stimulate your own thinking, or reassure you in your own convictions. The customs of your country might decree that our system was overorganized. However, before you dismiss our ideas as impractical, wait, and see them in operation. After you have toured our rehabilitation facilities you may find merit in our volunteer program. I hope so, for understanding the customs of other nations is important to each of us.

Presented at the Eighth World Congress, International Society for the Rehabilitation of the Disabled, New York, N. Y., Aug. 28 to Sept. 2, 1960.

You all are familiar with the writings of Mark Twain. In his fantasy called "Captain Stormfield's Visit to Heaven," Mark Twain might have been writing of our own space age when he said, "Heaven is a large place, my friend. Large empires have many and diverse customs. How can you imagine I could ever learn the varied customs of the *countless* kingdoms of *Heaven?* It makes my head *ache* to think of it." My friends, your heads may ache by the end of this Congress, but surely the ideas you carry away from it will keep your spirits soaring in orbit for the year ahead!

Volunteers in America come from every walk of life. They represent all the many strains that make up America. What are the forces in our American character which prompt our citizens to set the world's record for volunteer service?

I submit that as a nation we are still guided by a strong sense of idealism. Our goals are not entirely materialistic. We don't need Fidel Castro and Premier Krushchev to point out our imperfections. We try to correct rather than hide them. We admit that some of our citizens do not believe that "all men are created equal." Nevertheless, the brotherhood of man *is* written into our Bill of Rights. It *is* the law we seek to enforce. We believe in helping people to help themselves. Jefferson remains our hero. This is still the land of Lincoln. Our citizens who give time and energy in volunteer service in their communities seek to fulfill the American dream. They are motivated by a sense of gratitude for personal and national well-being.

Where do these volunteers come from?

First, let us look at the ladies. In this servantless age in America, young housewives taking care of big families work as hard as their pioneer grandmothers. Still, many find a few hours each week for volunteer service. They regard this as a refreshing change of pace. Older women with grown families are attracted to volunteer service as a welcome and useful occupation for free time.

Volunteers in rehabilitation come for special reasons. I recall the lovely young daughter of a friend who was recovering from a severe illness that had left her disabled. Rather than sit at home feeling sorry for herself, she went to work in the Center. Our patients enjoyed her youth, beauty, and willing spirit. And in return she gained in health and understanding. Through helping others she learned to overcome her own handicap.

Men have their own reasons for volunteering. Often a businessman feels that he will gain a more profound reward from community service than he gets in the daily ritual of corporation life. On Park Avenue, in New York City, you will see the headquarters of many of our major corporations. Life in these "crystal palaces," as we've come to call them, is somewhat like life in Versailles. Business ritual is patterned like that of a royal court. It is more organized than the human spirit might wish.

Volunteer services can provide a challenging interest for the executive. It lets him act as an individual rather than as an organization man. Corporations encourage such volunteer service as a way of developing an executive's talent and widening his horizon.

Here is an example of a businessman whom I know as a volunteer. He was understandably discouraged during a period when his corporation was in the

midst of a proxy battle. There was little hope that the company could be saved from those who sought to take it over. I am sure the hours of service he gave to rehabilitation during the many months of this struggle helped keep up his morale, and this outside interest helped him in the eventual victory over those who were "raiding" the company.

Another group of volunteers includes our senior citizens. People are living longer and retiring earlier in our country today. The science of geriatrics proves that skills do not atrophy at 65. Yet corporate life in our country recognizes that the demands made upon the individual are such that retirement is a measure of protection for both the corporation and the employee. Volunteer programs benefit immeasurably from the leadership of those who retire.

For those motivated by any one of these impulses the subject of rehabilitation is exciting stuff. "Helping the handicapped to help themselves!" What a wonderful plank in any platform! With this credo we at Hartford Rehabilitation Center find it easy to enlist able volunteers.

I turn now to the mechanics of operating our volunteer program. Let us look backstage and find the *deus ex machina.*

The primary tool we use in building our volunteer program is a Nominating Committee. I consider the Nominating Committee the most important committee in our whole organization. One's troubles are half over if he chooses the right people for his Board of Trustees.

We cannot afford to have people interested in only the honor of the office. Ours is a hard-working group. Many of our 36 trustees serve as chairmen of our committees. Trustees are expected to be available for regular meetings every month except July and August. Those who serve as officers must give much time and thought to our affairs. We need capable, energetic people who are able to use their time skillfully.

Our membership consists of *all* persons who during the previous year have contributed toward our work, either by gift, by the purchase of Easter Seals, or by voluntary service. We ask our Nominating Committee to select from this group individuals who have a special concern for the crippled or who are known to be widely interested in the development of our community. We also want representatives from the several cities and towns served by our Rehabilitation Center.

When specific talents are needed, we ask our Nominating Committee to find the right individual. Maybe we need a manufacturer to suggest how our industrial shop program should develop. Perhaps we need a banker who will bring us good financial ideas. It may be necessary to add insurance leaders with special knowledge of Workmen's Compensation insurance. If certain unions are not enthusiastic about employment for the handicapped, we may add a new labor leader to our Board. We need labor leader's help regularly to tell working people how to use our services.

Our trustees include: the town's leading banker, a young newspaper publisher, lawyers and insurance specialists, a member of our City Council, the head of one of our local unions (who always manages to sit next to the delightful wife of his employer), half a dozen other ladies whose careers are home making but

who, if they chose, would be able to run General Motors, a busy minister, a young schoolmaster, and several manufacturing executives. Theirs is the enthusiasm of an army on the march. They provide a pool of talent and energy which an agency such as ours could never afford to buy with dollars.

So far we have looked at the forces which prompt our citizens to serve rehabilitation. We have located the sectors in American life from which these volunteers come. Let us now look at how these men and women are used.

First, we have a Medical Advisory Council chosen from doctors who require our services. The makeup of our Medical Advisory Council is flexible and depends on the needs of our Center and its changing case load.

Second, we use volunteer leadership on our Board of Trustees. Our trustees frame the policies we follow. They assure our growth through sound financing. They encourage our staff in developing new programs and spread the gospel of Rehabilitation wherever they go. We know we have the best community-service agency in town. We expect our trustees to tell their private world this important news.

I have asked our trustees to wear a lapel pin, the Easter Seal symbol. We Americans are always curious about decorations. I am frequently asked, "Is this the new Legion d'Honneur, or the Order of Garibaldi?" This creates a perfect opening to explain that it is our symbol at Hartford Rehabilitation Center, and to tell about our program.

Once our Trustees decide upon policy, how do we carry out our program? Like many other organizations, we work through committees of volunteers.

Of these, one we find most interesting is our Planning Committee. This committee is charged with thinking a year or two, or a decade or two, ahead of our current program. Unlike the poet John Donne, we do not ask them to "tell us where past years are," but rather where we are *going*. Where should we place our emphasis in the future? They challenge our accomplishments today by reminding us of goals not yet achieved and problems not yet solved.

Running an organization means directing people. Our staff numbers almost thirty. Personnel policies are made by a committee of volunteers the chairman of which is a man whose profession is personnel relations. With our Director, it establishes policies involving job descriptions, salary schedules, employee insurance benefits, vacations, and holiday pay.

Another trustee heads a committee concerned with our housing and equipment needs. Our Planning Committee recommends that some day we should have a new building of our own. This Committee studies designs for such a structure. While we await the millenium, our staff has their help in obtaining equipment such as automobiles, desks, and typewriters. This committee checks prices and sources of supply. It frequently finds individuals or firms to contribute such equipment. In this way our funds can be saved for staff salaries or for supplies our patients need.

One cannot be long in America without realizing how greatly we are concerned with the arts of communication. We have a whole new science called Public Relations. It is no surprise, therefore, that our trustees consider it essential to have a Public Relations Committee. This committee suggests ways and means

by which we can create a favorable image in the public mind for our Rehabilitation Center. Can the community be made more aware of our service? Does it understand that our doors are open to rich and poor alike? This committee guides our staff in maintaining regular contact with local radio and TV stations and newspapers. It keeps an eye on our fund-raising effort.

Our Public Relations Committee recently took on another assignment. Our trustees felt we must increase the public's knowledge of rehabilitation and the work we are doing. So volunteers on this committee began a series of luncheons to which various groups within our community are invited. Luncheon is followed by a brief tour of the Center.

We find that the public appreciates such individual recognition. People are glad to be kept abreast of what is going on in rehabilitation. There is no suggestion of fund raising at such functions, yet this program has repaid us a thousand fold. It has brought many strangers to our door, who have returned again and again as friends.

We have a Liaison Committee to deal with local government authorities. We lease space within a city-owned, city-managed hospital. In turn we provide rehabilitation services for patients dependent on City Welfare. It is imperative that we have a committee to meet with city officials when necessary. We feel our objectives are better served through this liaison. The volunteers manning this committee have sought to correlate rehabilitation programs of private hospitals throughout our area to avoid needless duplication. You probably find it feasible to have some sort of working committee assigned to deal with your own government authorities. I commend this practice to you.

We have another Liaison Committee assigned to the Connecticut Society for Crippled Children and Adults, of which, as before mentioned, we are a part. This committee offers information about rehabilitation facilities to our elected representatives in the State Legislature and negotiates with State authorities.

Here is one example of the way a volunteer committee helps our staff face new challenges. Several years ago we were approached by parents anxious for a program for mentally retarded children. This group was upset because there were no training facilities for retarded children once they left our public school system. These parents asked us to set up a pilot project to employ the mentally retarded in our vocational training program. (We call these our Sheltered Shops.) They asked us to judge whether or not retardates could be trained for employment. If not, they would continue to grow up without a skill to help them contribute to their own support. Perhaps our staff could have won the battle alone, but it was much easier for them to experiment when their enthusiasm was shared by several volunteers. The program has proved successful.

Mention of the Sheltered Shop program brings us back to the heart of our matter. Our Center provides a complete rehabilitation service. This includes medical evaluation, social service, family counseling, physical therapy, occupational therapy, speech therapy, prevocational training, vocational training, sheltered workshops, job counseling, and placement.

One of our Sheltered Shops is a woodworking shop. Here our patients, while they rehabilitate themselves, are also rehabilitating broken furniture, and restoring antiques for customers.

Our Sheltered Shop Committee includes several volunteers whose work is manufacturing. These men help us guide our industrial shop. We refer to it as "Hands for Hire," by way of telling industry that we are ready to take on any job they assign us. Our volunteer committee helps us find machinery. They keep alert for new operations which our patients can do.

Volunteers working on this committee have educated the public to hire the handicapped. Benjamin Franklin said, "It is not the work of a day to remove the prejudices of the people." To these volunteers we are grateful for not a day, but for years of effort in this direction. Recently one of our volunteer ladies became indignant when she heard we were having difficulty obtaining employment for a double-arm amputee skilled in using a drill press. She bulldozed her way through a factory gate and convinced a personnel manager that he should give our patient a chance. The amputee started at $1.85 an hour in this drop-forging plant.

We are doubly blessed in finding volunteers to help in our program because in addition to our own trustees and committee members we can turn to our Women's Auxillary. The Women's Auxiliary of the Hartford Rehabilitation Center is an entirely distinct organization with its own Board of Trustees, its own budget, and its own responsibilities. In 10 short years, membership in this auxiliary has grown to over 1,200 women.

New members of the Auxiliary who participate in our program receive training from our staff. Last year there were more than 90 Auxiliary members assisting therapists and staff in the various departments of our Center. They gave over 3,700 volunteer hours in service. Student volunteers gave almost 500 summer hours. I have calculated that this amount of service would add up to 10 per cent in increased salary costs if we had to expand our staff to do the work done by these volunteers. In other words, we are paying only 90 cents for every dollar's worth of labor expended in our program.

Our Women's Auxiliary spurs our Trustees on to greater achievement. Last year our Planning Committee wanted a recreational program for discharged patients. The Auxiliary launched a pilot project offering a social program at the Center for this group. Through their pioneer effort we know that a full-scale program will be a huge success. We wait only for adequate space to set it up.

Our Auxiliary also plans picnics and a yearly Christmas party for patients.

The Auxiliary has been able to man a Speaker's Bureau to appear before service clubs such as the Rotary and Kiwanis. They show slides and describe our work. The Auxiliary also finds volunteer hostesses for us when we want groups to see the Center. When our Trustees schedule a noontime meeting, we let the Auxiliary know. Their committee cooks and serves luncheon, while we get our business done.

Our Auxiliary has developed a financial bonanza for us; members sold almost 50,000 Christmas cards last year. Profits were donated for equipment. This grant was in addition to a regular subsidy for student training and for staff expense in

graduate study. Again, I estimate we would need at least 10 per cent more in Easter Seal dollars if we could not count on these fairy godmothers.

Now let us turn to financing. Here again volunteer committees are vitally involved. First, our trustees have an Endowment Committee which encourages our friends to include the Rehabilitation Center among philanthropic bequests they plan in their wills. This is a delicate subject, but our tax laws today make most people willing to consider philanthropy.

Next in the field of finance is a volunteer Investment Committee. Whatever principal we accumulate is invested by this group.

For yearly operating needs, our trustees appoint a Budget Committee. It is their responsibility, together with our Executive Director, to set up a yearly budget, balancing projected expense with expected income. They meet quarterly to review how well actual income and expense compare with budgeted items. We find such watchful management a tremendous boon. Our Budget Committee determines how much income to expect from fees, grants, and services to other agencies. It then tells us what amount we must raise through the Easter Seal Fund-Raising Drive.

We might say that the Easter Seal Drive epitomizes the work of the volunteer in our program. We have dozens of volunteers planning and directing the campaign. Hundreds of volunteers handle campaign details. Thousands of good citizens volunteer to reach down into their pockets and to make out checks.

In our Easter Seal fund raising we ask trustees to act as advisors for particular committees in the Easter Seal Campaign. But basically our Easter Seal Campaign involves many additional people and new faces.

How are these people used? First we have a General Chairman for the Campaign. We seek out a man who is a top community leader, because names make news and attract other leaders to join in serving us. The General Chairman guides the conduct of the Campaign, based on plans made by a voluntary committee of advisors from previous campaigns.

There is also a Co-chairman for our Campaign so that we may always have trained leadership. He is like an understudy waiting in the wings offstage. He will serve as our next General Chairman. However, in the year in which he is Co-chairman, his only real responsibility is observation. We urge him to come to Campaign meetings and learn all he can about our Center.

Our General Chairman for the Campaign is assisted by several others. The chairman for Special Gifts is again a volunteer business leader. Many Easter Seal drives have shown that the public is starving us with $1.00 or $2.00 affection, by returning a dollar in our reply envelope in exchange for a sheet of seals. A decade or two ago when our budget ranged in terms of $10,000 to $20,000, this was fine and dandy. But we have grown like Topsy. We now need 10 times these dollars for proper budgeting. The Committee for Special Gifts seeks larger contributions from the public.

We also name a Corporate Gift Chairman. His volunteers see that special appeals are made to corporations in our area.

We have many manufacturing companies, employing hundreds, or even thousands of people. These plants often set up single drives which support several

philanthropies. Their employees are thus solicited once a year only. We have a special committee with its own chairman to keep in contact with such plants. Such drives represent many thousands of Easter Seal dollars for us; but each year at each plant we find a tendency to expand the number of health and welfare agencies sharing in the pooled funds. Therefore, our take from a particular plant may well shrink. Our volunteer leadership for such support must run harder and harder, contacting more plants each year just to keep up.

Since we campaign in several different towns, we appoint a volunteer as Town Chairman in each one. He or she directs the town's campaign and coordinates the work of other local volunteers. Many of these volunteers come from our Women's Auxiliary. For example, in one town we had more than 40 women from our Auxiliary working last year for over 5 weeks, handling returns received by mail. Another group of such volunteers contacts local industries and retail stores. The Auxiliary also volunteers to arrange for dozens of children who dress up as Easter Bunnies. These bunnies parade through town collecting coins from passers-by.

The work of addressing more than 60,000 Easter Seal letters is done by women's clubs and secretarial associations. Year in and year out, their members have addressed the envelopes. The task of sorting enclosures and filling the envelopes is assumed by another group of volunteers, church women in our community.

By now you must feel that, in addition to being the star of our show, we expect our volunteer to serve as ambassador, purchasing agent, hostess, director of advertising, banker, cook, nurse, ad infinitum. I must plead guilty to the charge. We expect our volunteer to play every role in our repertory.

What the volunteer does for us at our Rehabilitation Center is repeated in hundreds of centers throughout our land, and in thousands of other agencies and community activities. However, from the devotion of our trustees and the dedication of our many volunteers we feel that ours is a rather special fraternity. It is a fraternity of friends prompted by that special idealism of which we in America are very proud, an idealism which says that nothing good is impossible. You know the saying: "The difficult we will do immediately, the impossible takes a little longer." Of such stuff are dreams made, and accomplishments soundly built.

Enthusiasm for our program soon develops into a keen interest in the whole field of rehabilitation. We find friends coming forward to urge our City Council to grant us more space. When nothing suitable can be found, volunteer enthusiasm arranges to reclaim a building abandoned by the city. Volunteers find the methods and the dollars to make it usable. Out of this interest grows volunteer enthusiasm for an integrated health center in our area, serving several health agencies in our city.

Shortly after the designs were announced for the new "Lincoln Center for the Performing Arts," which is to be built in New York City, we had a flurry of excitement in Hartford. This new theater is to have special features for physically handicapped persons. It will have street-level entrances instead of steps, special toilet facilities with safety bars, and extra-wide doors. Friends in Hartford were

soon comparing notes on this architecture. They will approach our local opera house to see if some improvement can be made there. They want the handicapped in our town to enjoy theater and music readily, without embarrassment or inconvenience. The same group has now become a self-appointed watchdog committee. If a new hotel or major restaurant is announced in our city, its owners will be urged to omit awkward entrances and steps in public dining rooms. Then the crippled may journey out freely with their families and friends.

Such enthusiasm is good for our rehabilitation program. Think how wonderful it is for the patients we are serving. They know that the people volunteering to serve with them are not just sorry for them, but rather glad for them. Volunteers take pleasure in seeing that the handicapped have a Center where they can learn to help themselves.

I end as I began, with praise for our volunteer. Shakespeare provides the script. In "The Tempest" he might be referring in particular to our volunteers in rehabilitation when he says: "O, wonder! How many goodly creatures are there here! How beauteous mankind is! O brave new world that has such people in't!"

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Book Review

GERIATRIC NURSING. Third edition. By Kathleen Newton, R.N., M.A. St. Louis, 1960, The C. V. Mosby Company. Pp. 483, indexed. Price $6.50.

This text, as was also true of the two previous editions, serves to bring to personnel engaged in the nursing care of elderly persons two aspects of these services. The first deals with some general background considerations of the subject, such as the sociopsychologic needs of older persons, problems of their housing during health and in illness, desirable attitudes and skills for nurses in this field of practice, and such general needs of geriatric patients as those related to general hygiene and nutrition.

Two chapters have been added to this first section of the book, one dealing with rehabilitation and the nurse's role in this phase of care and the second with care of geriatric patients in their own homes. The need for careful preparation of patients and of their families for home care before the patient's release from hospitalization together with the desirable methods for providing this care are effectively explained.

The remaining chapters of the book consider the second aspect, the nursing care appropriate for elderly patients with specific disease conditions. Each chapter concerns itself with the diseases associated with each of the anatomic systems of the body. Although there are no major changes or additions in this section of the book, there are minor revisions in wording and some additional paragraphs in each chapter.

The reference list at the end of each chapter includes medical texts and articles from a variety of medical and nursing journals. Pamphlets available from governmental agencies and private organizations are also included.

It is to be expected that a book of 465 pages must present only a limited discussion of each subject, but the material seems to have been selected on the basis of the most specific needs of nurses who are providing care for geriatric patients.

Myrtle Coe